EXTRATERRESTRIAL BIOPOLITICS AND CREATIVE INDUSTRIES... P.11

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The general reconstruction of the world : *"Experimentation is not above all about verification but is rather the institution, the construction of a new reality"* p.4

LaboratoryPlanet

The Laboratory Planet

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Why are we working for our own obsolescence ?

Since the Second World War, the world has been progressively transformed into a full scale laboratory. 1 The model of a "laboratory world" has been added to the model of a "factory world".

Today geo-engineering is well on the way to being commonplace, justifying, in the name of the fight against the greenhouse effect and its consequences (tropical storms, drought, etc.), experiments modifying the climate on a very large scale and transforming the chemistry of the oceans.

Satellites permanently supervising and analysing variations in the Earth's activity are coupled with I.T. networks and technologies such as RFID and micro (or nano) sensors, creating an information-planet, a virtual-planet that even further reinforces the power of the long-distance management and control, or even the transformation, of the real.

This developing laboratory-world promotes the manipulation of the living according to the doctrine of "acceptable risk". The radicalisation of competition and the "short-falls" in planned investments result in tests in "real-life conditions": pharmaceutical researchers carry out experiments on entire populations in Africa and elsewhere; the dissemination of Genetically Modified Organisms is encouraged by all possible means, before the advent of Atomically Modified Organisms; wireless technologies

A live "ops center" of the british psychologial operations agency Strategic Communications Laboratories. This psyops center is in a country SCL won't identify (http://www.scl.cc).

The development of convergent technologies (bio-, nano-, cogno-, info-, robo-, sociotech) is the magic circle in which biological and mechanical species emerge from the laboratory and from new periodic tables. Much of this research is today carried out in secret (*). That is why an understanding of the present itself remains determined by the limited insight that we can have concerning information which is itself filtered or orchestrated. How can we speak of the present ? How can we know where we are or understand the situation we find ourselves in ?

demiurgic experimentation of a world that has become a laboratory. The rational organisation of this laboratory-world thus becomes an irrational organisation threatening those who have created it.

We are not among them, however. We do not work in, nor for, this laboratory. Nor are we its objects. What can be done with the immense, autonomous machine that has now taken on a momentum of its own ? Can we redirect the fate and the orientation of a laboratory whose creation none of us, or so

Elements of the actuality of the *vital combat*
on nanotechnology and the world that goes with it

BY THE OBSERVATORY OF EVOLUTION

1. A new genesis

Today the greatest ignominies exist not because we commit them but because we let them happen. They develop inside emptiness.

Robert Musil, *The Man Without Qualities (about 1920)*

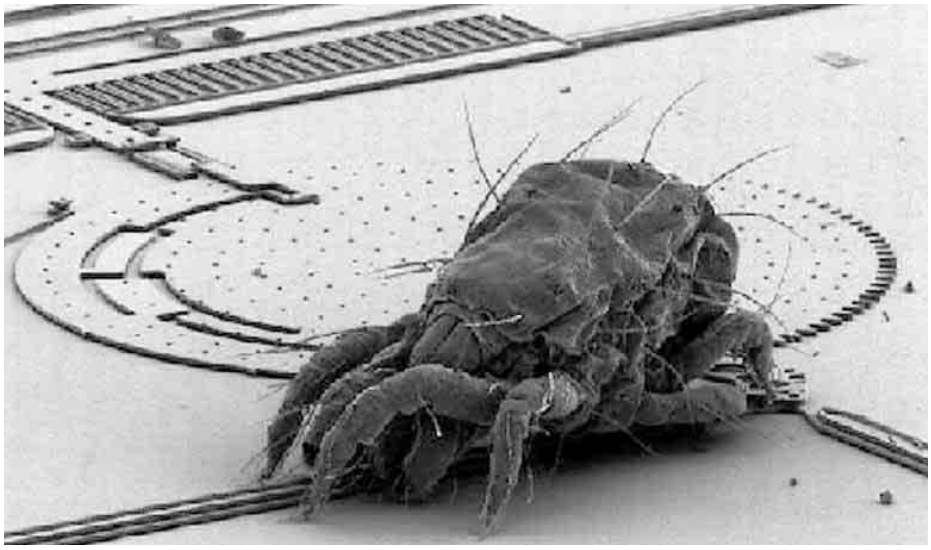
In 1989, at the same time that the ruling Socialists were celebrating the French Revolution with the greatest possible frenzy, engineers at IBM managed for their part to design a logo for the company made from the manipulation of 35 xenon atoms. Since then, and even if it only represents another step along the road towards the artificialisation of the world that we are employed to produce, the development of nanotechnologies has undergone a rapid expansion that would have seemed frightening if we had not been long used to strive to become what would soon need to be replaced.

Nanotechnologies open the way to the reconstruction of the world using reworked elementary entities. In this new genesis all classifications of existing beings are abolished. Of course the subjective barrier between the inert and the living will no longer hold true; the same goes for the barrier between species even more.
As for the well-known immunology barrier which theoretically prevents living organisms from being infested by foreign bodies, it becomes redundant; the nanoparticle penetrates into living cells as easily as sugar dissolves in water.
The transgenesis on which molecular biologists are working will be achieved "naturally". Animals and machines will merge in the Megamachine, consolidating the artificially living character of the social system and the machine character of naturally living organisms. Last, self-reproducing nano-entities could be used to create macro-organisms. The last point is a great subject of concern for the *mutants* who fear that social life is escaping them while the *neo-mutants* (the bolder mutants) overcome this fear and joyfully accept to become anything whatsoever inside the Megamachine.
The latter, through the dense interconnection of everything inside it, will resemble a large soup tureen in which all the bodies that have shed their being will bathe, organised in a magma of extravagant positions. This is what is called convergence: nano, bio, info et *cognito* will form just one matter and one globalised subject.

Given such a vision, it is perhaps vain to try and envisage the potential risks involved in this new advance in technical engineering; all of them are present in this extraordinary dilution. With the definitive disappearance of the order of natural reason, it will no longer be possible to speak of *pollution*, a term that used to indicate that a material element was to be found where, in theory, it had no reason to be; for example, that a radioactive caesium atom had no business being in a mushroom or in the encephalon of a child.

"There is loads of free space at the atomic level"; this remark by Richard Feynman, the illustrious and eccentric physicist (but not to the extent that it kept him out of the fabulous Manhattan project, in which the most brilliant Western physicists took part), is celebrated as an invitation to go and look into the intimacy of matter for what has become rare in our environment: more space, energy and new markets. Yet the amount of energy and hydraulic resources needed by the new industrialisation of matter will soon absorb practically everything that remains of our macroscopic natural resources (that is, what people today can touch with their fingers and put in their pockets). The social and geopolitical tension thus created will probably make a large increase in security arrangements indispensable.

If the motor of development of nanotechnologies was the blind race for power that beings, at first sheltered and later enclosed in the social space, have never managed to hold back, then it is quite natural that the political, military and economic deciders rush headlong into this new game of evolution, since their social advancement does



Microelectromechanical Systems (MEMS) with Spider Mite, Sandia Labs. This Micromotor have made possible the development of Sandia National Laboratory's nuclear weapons microlock. (Courtesy of Sandia National Laboratories Intelligent Micromachine Initiative; www.mems.sandia.gov).

out.
To sensitive souls who, faced with this worse-than-Orwellian situation, are seized by a new, deeper vertigo, the neo-mutant ideology will explain that, after all, this evolution is only continuing what mankind has always done and, in any case, no one can do anything about it, which although not definitively proven, is all the same quite likely and in any case would need to be disproved. This last task could well be quite tricky, which will not stop some people finding it pleasant.

2. Reason abused

Without our animals — which will be taken away to be burnt because they don't have microchips — we'll be nothing.
A sheep-farmer, overheard one evening early in 2006 at the autonomous Domaine de Matens, France

The critique of progress is achieved — and has been for several millennia —, that of the economy of production and of liberalism more recently, but no critique, not even the best recent social analyses, has been able to alter the direction of social development — which confirms in passing that until now what has driven this development is certainly not desired or driven by human reason.

The time has passed when we could ask ourselves if technological revolutions were good or bad, if science could be useful to mankind; each technical development is catastrophic.
To plead the cause of progress, we can no longer say that it has maintained the demographic situation of human beings in an extraordinary way since this success has been transformed into a nightmare and the mutants are now calling for a cull of human beings (cf. http://mutation.ifrance.com/hominisation.htm).
It is still possible — despite the multiplication of natural catastrophes — to celebrate the fact that modern mankind no longer has to fear bad weather, predators, and many physical constraints like long distance travel or the weakness of his own body. That these improvements have confined human beings within social arrangements that each day are more controlled and supervised, that an exchange, which is the basis of life, no longer takes place between humans and the natural environment, but between herded humans and social monitors, none of this should disturb overmuch the mutants that we are.
To prolong the progressist plea it might also be recognised that technology has brought about a whole series of emancipations of which the most obvious is the distance travelled by mankind from the old domination of nature and the superstitions that were a part of the ancestral state of our harmony with the world.
course, some human beings are delighted with social progress, it is clear that no one ever asked the question democratically to see if it is wanted. It was a condition for social evolution, and people could only try to feel happy about its positive effects.
It is still heard, although more and more rarely, that deciders decide, after all, and that humans invested with political responsibility have approved what has happened. This argument appears today almost grotesque: the deciders in power have only reached their positions because they have accepted the extravagant demands of technical development beforehand, that is, they have never decided anything other than to let the forces of domination have their way.
But what should finally ruin the idea of progress in the eyes of human beings is that it has made them obsolete. It has been said that humanity is a plastic being who can be adapted to every transformation, the agent of an evolution that destroys him while constructing him. An instrument, therefore, but also a victim of evolution. A victim who is now being successfully challenged in the production and the use of innovative systems. That is why the conception and the use of what is manufactured is being daily transferred more and more to self-programming machines. And the perspective of a world rid of this cumbersome parasite is now being envisaged.

The extraordinary historical context in which we find ourselves is therefore that of social division, the *fracture sociale*; not the division once evoked by the President of a Republic in France on its way to being privatised, to indicate what separates the zealous servants of evolution from those who, unable or unwilling to keep pace, find themselves at the back of the pack in the banlieues; here the division is between machines and social institutions – which now form the most influential part of society and control its development according to their own interests – and, on the other hand, the humans who find themselves enclosed in this increasingly controlled system.

All of us are thus called upon to play an active role, as effectively as possible, in the eradication of the living, or risk seeing ourselves ever more rapidly excluded from the life of society. This subjection of the individual in the elaboration of a destructive and dominating social system is carried out by virtue of a mechanism that is at work everywhere. This mechanism (called *the bonus of the negative*) can be explained summarily by the fact that it is statistically improbable for humans to decide everywhere as one to cease collaborating in the pillage, even if this pillage is ruining the world they inhabit (and those who do not take part get left behind). The introduction of the policy doubtlessly aiming to protect human societies from this phenomenon has historically only projected it with more

citizens movement, the antiglobalisation movement and most groups or individuals who try with varying degrees of insight to resist what is happening. Perhaps it is also what many people intuitively believe who have decided to do nothing, not even to think.
In fact, the present period is still one *in which we must question everything, or risk falling into helplessness or thoughtlessness*.

If the present situation gives rise to a resentment that in some ways resembles that felt by a defeated people when they have to give up their own culture and embrace that of their new masters, the particularity of the present situation is that the last human victors in history– let us call them the Westernised techno-merchants – now have the feeling that their own end is at hand, and that the new masters, if we try to see something familiar in them, have the features of robots and machine systems.
Now what has until now characterised the mutants (those who try zealously to obey what they believe is the path of evolution) is that they could accommodate the demands of modernity by adopting an emancipatory ideology that still seemed *humanly* reasonable. Today this is no longer the case; all ideologies - the supernatural, the divine, the economy, humanism, rationalism, socialism - have been discredited. What we must agree to in order to prosper today defies human reason, including the spirit of the scientific method, and it is clear that if we had to continue along this path we would have to shed our human appearance. Nothing that can be reasonable functions any more, apart from the idea of changing oneself into *anything, so long as it works*.

That is why the new ideology, the neo-mutant ideology, is conceived precisely to explain why we should find it better to go beyond the human stage.

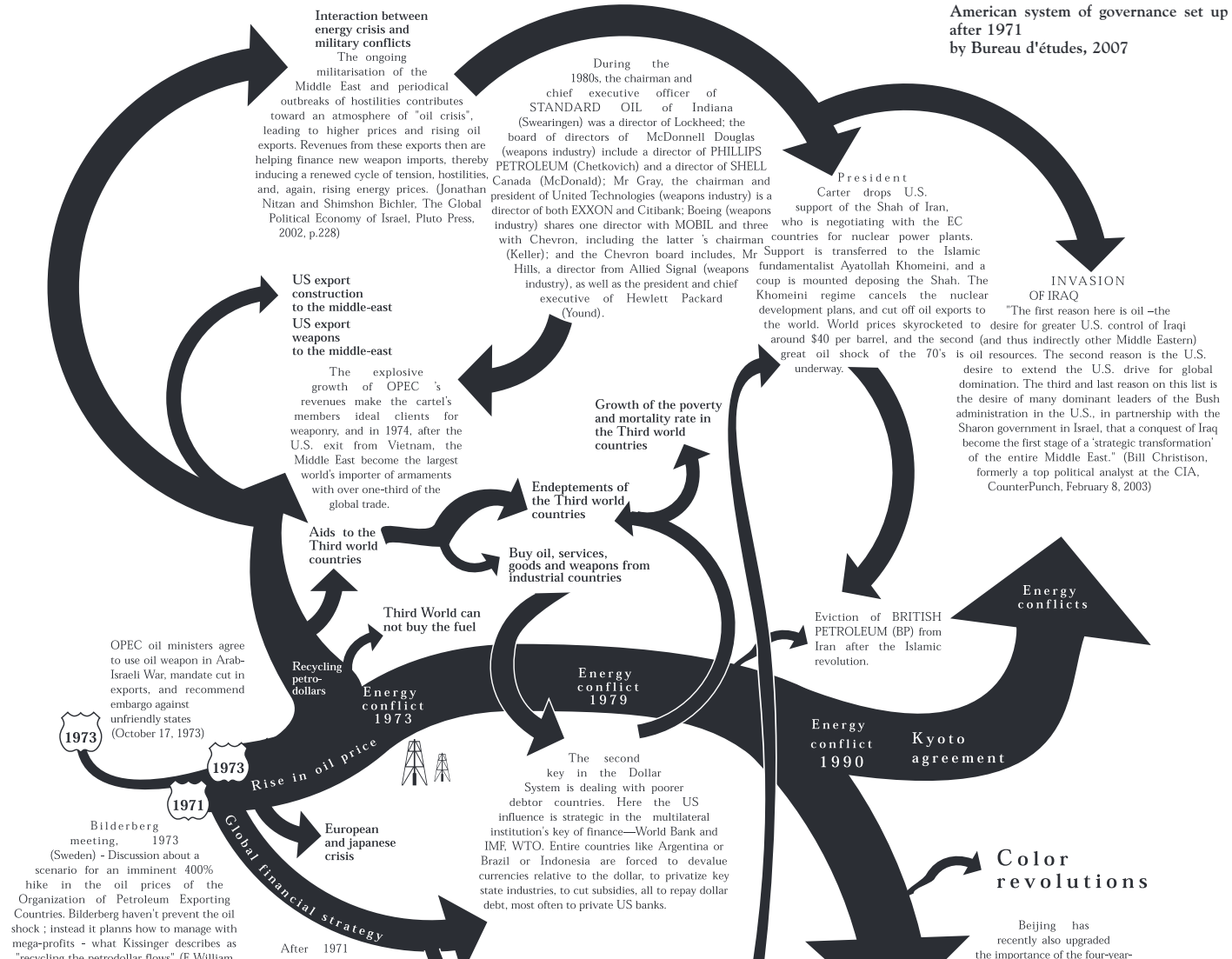
3. The vital combat, *in France and elsewhere!*

Since we are already dead, let's make the most of it!
(Zapatista proverb)

For there to be a chance of turning things around, it would not only be necessary for the majority of humans to see that it is better to leave the system and live differently by devoting their energies to reconstruction projects, but also that they should realise it everywhere at the same time. And above all that those invited to join the techno-market system should refuse to do so.
The many existing resistance strategies come up against this difficulty. For example, the concept of 'uneconomic growth' which is based on a quite realistic view of our ecologic situation, seems to ignore that growth is not a chosen or organised choice of evolution by mankind but an obligation imposed by the requirements of domination of the most influential societies in the rational colonisation of the living world. How can the supporters of this concept imagine that the society in which they find themselves will accept a huge decrease of its power at the very moment when a billion individuals are living through an incredible period of growth and could soon, as a result, take control (both themselves and those who will work with them) of the countries of *uneconomic growth* even more easily than the West colonised the world.

So we will not find the forces able to stop the mechanisation of living beings within populations that have accepted, whether they wanted to or not, to create this world. It is essentially within what still exists outside the techno-market sphere or in what has not yet grown there, that we should look for a potential driving force for this movement. It is thus on the populations of the south (providing that we do not have too many illusions about their capacity to remain deaf to market propaganda) and perhaps on the young generations of the north (those who have not yet left the school system to take up their posts) that we should count.
In our countries, it is not unthinkable that the place from which massive and significant resistance to what is happening could be organised is the secondary school. To maintain a human community in which children are not admitted to the canteen without the agreement of a biometric system giving access to atomised meal trays, can only result from a strong desire and a reflection on the part of secondary school students. It is for a generation in the making that falls the hope of preparing a life of dignity rather than applying for a job as a social agent. Their elders, participating individually in this combat, will only be able to lend a hand and if necessary give some helpful warnings.

February 1st, 2006



The general reconstruction of the world*

BY
MICHEL TIBON-CORNILLOT,
WRITER, EHESS

Laboratories as the building sites of a new world

The founders of modern science – Galileo, Marin Mersenne, Descartes, Pascal, Gassendi – considered that mathematics was not only the fundamental language of knowledge, but also constituted the very structure of the "real". This fundamental status attributed to mathematics implies both the certainty of its demonstrations and the fact that it constitutes the substratum of "Nature", of the "real". By examining ourselves, each of us, according to Galileo, "can rediscover the use of our understanding and recall the foundations of our knowledge of reality, the alphabet or elements of language – of mathematic language – spoken by the nature that God created"(1).

But the founding fathers never limited themselves to this bare fact or to making sweeping affirmations. Galileo, for example, who was one of the most active, and who had the most practical spirit, was convinced he possessed the mathematical key to the real but was not satisfied with a theoretical reconstruction of the world. He also wanted to account for the sensible world, the physical world, to account for the complexity of its movements, for the incredible diversity of its forms.

The aim was to find the mathematical essence of nature beyond the chaos of impressions, the clash between things, "the confusion of phenomena". Such was the new programme that the search for truth should follow. But this in fact was where the difficulties began, as Galileo's enemies had foreseen. That is why Galileo has Simplicio, the character in the *Dialogues* who represents his Aristotelian adversaries, say that "these mathematical subtleties do very well in the abstract, but they do not work out when applied to sensible and physical matters."(2) Terrestrial matter never materialises in precise geometric forms. In the real world, there are no straight lines, no planes, no triangles and no spheres, so we cannot apply the laws of geometry to the physical world. If in spite of everything we keep faith with the founding hypothesis that gave a central position to mathematics, we can maintain the principle according to which the real is, in the final analysis, mathematic, and admit that physical beings resemble geometric beings approximately. But we come up against another insoluble difficulty to the extent that, having no means to measure the gap between geometric and real figures, we cannot consequently claim to have access to true knowledge of the real. Galileo, alias Simplicio, takes up the profound criticism Aristotelians made against a mathematical approach to the physical world: it is impossible, with the help of precise, rigid, simplifying mathematical reasoning to do justice to the multiple, imprecise, changeable reality of the physical world.

To escape from this vicious circle, Galileo invented a solution that was to play a prominent role in the development of modern science. He criticizes equally those who think it is enough endlessly to affirm the eminent role of mathematics, and those who deny it this pre-eminence. Rejecting its purely abstract character, Galileo disclosed the reality of mathematics to all by embodying it in phenomena that had it as their basis: experiments. This is the deepest meaning of experimentation, the origin of laboratories.

For Galileo, mathematics precedes experimentation but does not replace it, since experimentation is where it is embodied. The language and method used do not come from the experiment but are its precondition: they constitute it. But in a deeper sense, experimentation is in fact based on a "metaphysical" change in our view of the world. It is not only constructed using the theory but is also required to reveal the accuracy of the conceptions that inspired its design. Experimental activity introduces a new presence into the sensible world, objects and movements whose being is not only rational but also perceptible, concrete.

The threshold Galileo crossed in devising his famous inclined plane experiment is a striking revelation of the entry of the first objects, both concrete and intelligible, of the first rational and real phenomena, into a truly real, but still confused, world. This is how Galileo describes it: "In a wooden beam or rafter about twelve *braccia* long, half a *braccia* wide, and three inches thick, a channel was the length of this channel, and the time of its descent being measured, this was found to be precisely one-half the other… the times of descent for diverse inclinations maintained among themselves accurately that ratio that we shall find later assigned and demonstrated by our Author."(3)

The experiment is designed to embody a demonstration, a law, that of the fall on inclined planes. The first invention consists in substituting for the study of bodies in freefall – almost impossible to measure – their fall on an inclined plane. Moreover, the fundamental conditions of the experiment are organised according to the requirements of theoretical measurement. The elements of the experiment – sphere, plane, measurement of the angles and the duration – must be conjured out of nothing and, to this end, its artisans are obliged to invent them following the geometric models the elements are meant to embody. Lastly, the way the falls are organised, the scale of the distances travelled and the measurement of the angles between the horizontal and inclined planes determine the experiment's arrangement. The experimental structure thus created and organised on Galileo's desk can, at a price, confirm the accuracy of laws of which the mathematical expression had been established beforehand: "By experiments repeated a full hundred times, the spaces were always found to be to one another as the squares of the times. And this [held] for all inclinations of the plane."(4)

The part of the table on which the whole apparatus of carefully polished planes was placed, where the unnaturally round spheres were rolled, is the forerunner of the laboratory. It is in the reserved space of the laboratory that experiments would be organised and instruments used that embody concretised theories; where, in short, a collection of objects and events reconstructed according to the principles of mathematic intelligibility would be progressively substituted for the world of conspicuous, confused, elusive, everyday experience.

From enclosed spaces to space-worlds: "rebuilding the world"

Into a chaotic world Galileo introduces a new line of intelligible phenomena and beings, presenting the first creations transparent to mathematic intelligibility in the sensible world. He inaugurated a new phase of history in which a new world, reconstructed from the debris of the old, was constituted and developed. He thus opened up a vast workshop in the West, where men would pass from small, carefully sealed off laboratories to other rational spaces, such as the factory, in which rationalised labour and machines would reduce and transform raw materials on a large scale and disseminate technical objects all over the world. And this process, in ever wider and closer concentric circles, would in turn form new reconstructed, artificial, increasingly rational nature. This first constructed experiment, founding the space reserved to laboratories, set in motion a complex synergic movement in which scientific realisations would leave the laboratory and be transferred to industry, which, in turn, would spread the results in the social life of mankind. From this process a new world – our own – would gradually emerge and be put in place.

The formation of scientific reason includes both the speculative aspect already mentioned – the setting up of new approaches, the stress laid on quantification – and a practical aspect, which is revealed by experimentation and which regularly gives rise to many misunderstandings. *Experimentation is not above all about verification but is rather the institution, the construction of a new reality*. Through the predominant place taken by experimentation and laboratories, from experiment to experiment, from laboratory to laboratory, the existence of this other aspect of modern reason appears, its militant and activist side. Galileo did not merely affirm the homogeneity of mathematics and nature: by devising the first constructed experiments, he found a way to check this central affirmation using rational instruments and experiments to produce, in turn, new, intelligible phenomena. He was the first to try and substitute for the world of sensible experience another world. As it developed, this new world became more complex but was to remain necessarily permeable to the work of reason. In the process it had to shed the least trace of irrationality. This was the price to pay for the birth and growth of this new constructed

nality at work in modern sciences would thus have two aspects, a speculative and theoretical aspect and an activist and militant aspect, the objective of which is to reconstruct nature and make it perfectly transparent, translucent in the eyes of speculative reason.

Crossing high mountains: making modifications of the "real world" unilateral

It would be highly presumptuous to affirm that thanks to an act of will, necessarily subjective, it could be possible to go back to the poetic sources of living. One of the sources of Western power in its modern guise in fact consists in embodying, embedding its "collective imaginary structures" (5) within a sort of real world that must be endlessly reconstructed. The anthropocentrism of the Jewish and Christian monotheisms, the human-divine kinship they affirm, are deeply embedded in this process; more, they are in all probability at the origin of the reconstructive agitation tending to refound a world that is increasingly "spiritual". The blindness of their faith alone allows us to grasp why Jewish and Christian believers inevitably fail to recognise the deadly ravages of their actions.

The real world must be reconstructed… and it is, using bulldozers, bombs, factories, tractors and pesticides. But it is also reconstructed with mathematics and modern science, and lastly with machines, robots and computers. The issue is not only to conceive the world rationally but also to reconstruct it so that it will become … rational. But the rational evolution of a reconstructed world tends to converge, between thought and action, and to be organised *unilaterally* as the only world possible. When ways of life take root that are based on industrial labour, collective transport and rigid timetables, on rational habitats, then the only true world that each of us must live in is organised forever … because no other worlds exist any longer. Is it really necessary to recall that the deepest sources of tyranny do not reside in the all too visible existence of coercion but in the accepted and internalised forgetting of other worlds, of those that have been engulfed but also those that are nonetheless still possible.

Both approaches we have outlined here, digitalisation (see text page 8) and general reconstruction, clearly point to the attribution of a divine position. The control of space and time seem firmly acquired and the entire planet is submitted to the "diktats" of the human race. But one must ask if this is actually the case, since these controls are progressively carried out through the activity of automatons, machines and cyborgs, which have played and are still playing a major role in the attempt to remodel the Earth and mankind. Should we read into this animation of "inanimate" structures - increasingly autonomous and skilful, increasingly diverse and numerous - one of the hallmarks of industrial societies, in a word, the very presence of the divine? Is it not thanks to the omnipresence and the power of these entities that such societies maintain their existence, spread across the surface of the globe, defeat the revolts continually stirred up against their functioning and finally find a relevant model of social survival, beyond temporal manifestations ? (6)

NOTES

*This text deals in more detail with elements of an article entitled "Se souvenir des mondes vivants" ("Remembering living worlds"), published in the proceedings of the symposium "L'habiter dans sa poétique première" ("The living in its first poetics"), Cerisy, September 2006, Ecole des Hautes Etudes en Sciences Sociales (EHESS).

(1) A. Koyré - Etudes Galileonnes - Hermann, Paris, 1966 - p. 286

(2) Galileo Galilei - Dialogo sopra i due massini sistemi del mondo, Pto-

In vivo,
Biological experimentation on the living

BY ALIOUNE DIOP,
ANTHROPOLOGIST

Image du film de Michael Crichton, "Coma", 1976

The wisdom of ancestral societies led the living to ritualise the separation with the dead as a relation with the after-life and as a hygienic separation, in order to preserve those still among the living. With the advent of rationalised organisation, the living strove to keep a hygienic distance from the dead in everyday life, to separate as much as possible life and death – until the living had no more contact with death. Experimental science underwent a fundamental turning point with the birth of biology, passing from experimenting on dead bodies to experimenting on the living. The rule was then established that *in vitro* experiments (outside the organism – in a test-tube) should precede *in vivo* experiments (on the organism – animal or human).
The end of the eighteenth century was a turning point in the relation of the living and the dead. Mistakes made by the authorities during certain epidemics (cholera in Europe, smallpox among the troops of George Washington) increased awareness of the need for hygiene in the organisation of highly concentrated populations (barracks, prisons, hospitals, etc). The rise of demographic policies (following Malthus) would sanction the reification of the population. Biology was born, establishing experimentation on living organisms.

The birth of biology

At the end of the eighteenth century, Paris smelled of rotting corpses. The cemetery of the Innocents (in the Halles district) had been in use for nearly ten centuries and had become a source of infection for all the inhabitants in the area. Faced with the unbearable situation of open-air mass graves, the monarchy ordered the construction of the catacombs in 1785. The transfer of bones and corpses took place ritually every evening at nightfall. The Revolution soon followed (an insurrectional climate?) and one of the first laws of the constitutional monarchy (December 14, 1789) concerned hygiene, requiring municipal authorities to "let the inhabitants enjoy the advantages of good order, especially as regards cleanliness and salubrity..." The transfers continued until the end of the reign of Napoleon. (1)

In the same period, the vitalist current became very powerful in medicine. In the eighteenth century, "life", strictly speaking, did not exist, but only "living things". Doctors, naturalists or physiologists at the end of the century of the Enlightenment admitted their inability to grasp rationally "the secret movement of things" within living beings, beyond mere mechanical principles. Paul-Joseph Barthez, first a doctor to the king before serving the first consul Napoleon Bonaparte, established the bases of the philosophic conception and strove to define "life" as the matter that contains a principle he defined as the "vital force". François-Xavier Bichat, one of his followers, would define life as "all the functions that resist death". By death, Bichat understood all the physical and chemical processes that in his view characterised the non-living. Bichat rejected experiments on the living, considering that the simple action of a scalpel on a living organism is a physical action (thus acting on the non-living), which can only disturb the normal working of the organism, and thus teaches us nothing about the "vital principle". Bichat therefore limited himself to comparative anatomy by dissecting corpses in order to understand the way organs worked in living things and the action of diseases. Bichat died prematurely in 1802 at a time when the word biology was being formulated by Lamarck, who would try to explain the heredity of character and the evolution of species with a generally vitalist perspective. From then on, the search for an explanation of the driving principle that is "life" would legitimise experimentation on living bodies.(2)

Retreat from heterogeny

The vitalist idea persisted throughout the nineteenth century, particularly because of popular feelings that experimenting on the living was unhealthy, anti-religious and contrary to the Christian perception of a soul ani-

reproduction were drawn from experiments on black women. In the Victorian era, white women did not want doctors to examine their genitals nor undergo painful operations without anaesthetic. It was impossible for black women, on the other hand, to say no. It should be added that the scientific community had provided the medical bases for slavery by affirming that black individuals were very different to whites, medically and biologically. It was said that blacks were less intelligent, subhuman, perhaps not even completely human, that they did not feel pain, and were immune to illnesses like malaria and sunstroke, which made them perfect labourers in the fields. By supplying arguments to form "scientific racism", science had already given its approval to the institution of slavery, but was also serving its own interests by establishing the foundations permitting doctors to buy black slaves for their experiments. In America, where the question of slavery led to the Civil War, black people were used, in their majority or even exclusively, for the conception of vaccines and for experimental operations. Their consent was facultative and the experiments were rarely carried out with a therapeutic aim, but mostly with the goal of extending medical knowledge. The vitalist Christian ethic began to be used as an alibi for shocking experiments on individuals who were in any case considered by the scientists as less human than themselves.(3)

Pasteur, however, who was influenced by a form of vitalism, demonstrated the inexistence of "spontaneous generation", a persistent vitalist idea, and proved that a living being possesses at least one ancestor from which it drew characteristics. He thus dealt a blow to the heterogeny that distinguishes the living and the non-living. His research led to a better comprehension of elementary hygienic rules, to the pasteurisation of foodstuffs and to the discovery of vaccines against rabies and anthrax. His pupils, the pasteurians, launched an attack on the great epidemics in the countries of the South. Basking in Pasteur's popularity, the doctors represented colonial optimism. They would put their scientific skills to good use in the organisation of troops stationed abroad and help put down sound roots of colonial organisation. Doctors carried out the cleansing of the colonies and advocated the separation of its populations. With the pasteurians, medicine not only became an instrument of occupation, but also an instrument of colonisation and colonial politics.

Inferior living things

The beginning of the twentieth century saw the promulgation of important public health laws in Europe. While the "medicine of proof", involving the use of sta-

laws of Mendel, was the first to use the term 'genetic' (4). His rediscovery established the idea that independent and juxtaposed material particles (later called genes) are transmitted, according to immutable statistic laws, from generation to generation. The gene quickly became the basic materialised element of old deterministic conceptions and eugenistic and racist projects.

From 1932 until 1972, the famous American example of Tuskegee well illustrates the persistence of scientific racist views in the use made of the black population for experiments. An in vivo study was carried out by the American public health service on syphilitic black people in the village of Tuskegee in Alabama. For forty years people were led to believe that the patients were medically supervised (they had, in fact, free meals, aspirin against pain, draining of the spinal cord, assurance to cover medical fees and funeral expenses) while making sure they received no treatment from any other source. The objective was to understand the "natural evolution" of the disease(5).

The cataclysm of vitalism, evolutionism and genetics progressively led to the worst eugenic and racist ideologies in the first half of the twentieth century. During the Second World War, Nazi scientists carried out experiments on living people, considered as inferiors with a poorer quality of genes and possessing weaker "vital forces". The first document of medical ethics after the Second World War was the Nuremburg Code, adopted after the trails of Nazi doctors in 1947. The international declaration of Helsinki in 1964 would complete and gave more precision to the Nuremberg Code.

The patenting of "non-natural" living things

The American victory quickly led to the setting up of a new science of living things adapted to the nation's industrial policy. In the 1950s, molecular understanding of the cell and Watson and Crick's discovery of the structure of DNA resulted in the idea that life could be reduced to matter. The universality of the genetic code allowed scientists to postulate that the mechanisms governing all living organisms were of the same nature, since all beings derived from the same alphabet. As each gene can function when transferred into another living organism, it is possible to subjugate genetically any living being to the expression of the genetic programme of another living being, simply by transferring its genes.

In 1980, the "biological" made its entry into the realm of

Continuation of the article "In Vivo"

things should no longer be considered as "products of nature" if human intervention were necessary in their creation, was to set a precedent all over the world.

The decision triggered the adaptation of patent law for new techniques of genetic engineering and hence even of new biotechnological procedures. The appearance of computers has completely modified the access to biology and the 1970s saw a long battle fought out by laboratories to impose bioinformatics. Without doubt the most significant example is that of the patent obtained immediately after the Chakrabarty decision by the University of Stanford, concerning the technique of recombinant DNA, the first real technique of genetic engineering that opens the way to the cloning of genes and hence even to the study and the manipulation of genetic material of living organisms. Developed in 1973, the invention had not been approved for patenting until then since it used "a procedure of production of molecular chimeras with biological functions", and was thus considered inadmissible by the patent office (7).

In 1987, the American patent office definitively endorsed the Chakrabarty decision by recognising the possibility to bring within the field of patentability all biological material that needed human intervention for its creation. It was this "human intervention" which lent them their non-natural characters, even if the properties in question come from nature, as is the case for sequencing and the identification of the properties of a particular gene.

Following this new law, in April 1988, for the first time in the world, a patent relating to an animal was granted. The following year, as a direct consequence of the bioinformatics explosion, the term "in silico" was used to express the fact that from now on, alongside "in vivo" and "in vitro" experiments, we would have to reckon with "in silico" experiments using computers, computer chips or simulations. The term was later to be used to support the creation of genome programmes (8).

The dominant discourse of genetics today sees the living world as a gigantic machine of which the first and constitutive elements, genes, are put together like a Meccano kit. Genetic science in the twenty-first century claims to go beyond the dead-ends of twentieth century genetics and the future tendencies of research pertain to the genomics of public health, to pharmacogenomics, to synthetic genomics and the convergent technologies of genomics. Genetics has targeted rare diseases, determined by a single gene and concerning a very small part of the population; genomics aims to deal with diseases affecting entire populations and communities, whether they are common (cancer, diabetes) or complex (intense interaction with an industrial environment). A real tool for refining biopolitical administration, genomics aims to improve the performances of living beings all through their lives, thanks to preventive measures (screening for predispositions and treatment prior to the appearance of symptoms) or relating to the early detection of behaviours (hyperactivity and other "genes" of delinquency or insanity): a future of faulty or improved body-machines, where the science of "pre-crime" will approve intervention even inside the family…

An analysis of the conditions of life, when it is human, cannot be limited, even for a biologist, to a genetic "Meccano" approach alone. If skin colour is undeniably hereditary, its gene has never been located: it is not a simple genetic effect. Mortality rates in Africa do not depend so much on the state of medicine as the state of production and international exchanges. The relations between genes, the environment and organisms are reciprocal relations in which the three elements are both causes and effects and to ignore this original interaction is to expose oneself to simplifications that betray the complexity of the living world (9).

NOTES

(1) Le dix-neuvième siècle à travers les âges "âges' ('The nineteenth century through the ages'), Philippe Muray, Editions Gallimard, Tel 1999.
(2) Les précurseurs de Vernadski dans la physiologie française " ('The precursors of Vernadski in French physiology'), Pierre Bonnefoy, revue Fusion N°108, janvier-février 2006.
(3) *Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present* ", Harriet A. Washington, Doubleday, 2007.
(4) 4) The priest Gregor Mendel is considered as the pioneer of genetics. In the middle of the nineteenth century, observing the transmission of morphological characteristics of pea plants through several generations, Mendel defined the terms phenotype and genotype, and set out, after doctoring his figures somewhat, the so-called Mendel's laws, the basis of modern genetics. William Bateson became the most ardent promoter of Mendel's laws in his book, published in 1902, Gregor Mendel's Principle of Heredity. Bateson was the first to use the term 'genetic' in 1906.
(5) *Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present* ", Harriet A. Washington, Doubleday, 2007.
(6) 6) Diamond V. Chakrabarty, 447 U.S.303 (1980). In 1972, General Electric applied for a patent for a discovery made by Ananda Mohan Chakrabarty relating to a genetically modified micro-organism that could intervene in the absorption of certain kinds of marine pollution, but was categorically turned down by the American patent office. The unprecedented demand was the object of many appeals by General Electric, which went all the way to the Supreme Court of the United States in 1980.
(7) 7) Fabienne Orsi, 'La constitution d'un nouveau droit de propriété intellectuelle sur le vivant aux Etats-Unis' ('The constitution of a new right of intellectual property on living things in the United States'), Revue d'économie industrielle, N°99, 'Les droits de la propriété intellectuelle : nouveaux domaines, nouveaux enjeux' ('Intellectual property rights: new domains, new stakes') , 'Pharma : Pharmacie et biotechnologies : le nouveau droit du vivant' ('Pharma : Pharmacy and biotechnologies: the new right of living things'), online since June 15, 2004, URL: http://rei.revues.org/document.html?id=7&format=print
(8) http://en.wikipedia.org/wiki/In_silico
(9) *The Triple Helix: Gene, Organism, and Environment*, Harvard University Press (2000) by Richard Lewontin.

Dissemination and duale usage

by Ewen Chardronnet

At the beginning of the cold war, the nations under American influence were faced with the risk of the dissemination of "dual-use" technologies (civilian and military) which would provoke the loss of both their tactical advantage and the secret of their technologies. They put into place a policy of export controls, a legal framework and a diplomacy of technology transfer. The first international agreement, the CoCom or Coordinating Committee for Multilateral Export Controls (1), aimed to limit the transfer of goods and strategic technologies towards countries under Soviet influence.
This followed with intergovernmental groups that worked on limiting the proliferation of goods and technologies, allowing notably the elaboration of engines of mass destruction and their associated vectors, such as the London Club (created in 1975) that became the Nuclear Suppliers Group, complementary to the committee Zangger, which facilitated the application of the Non-Profileration Treaty (NPT) of 1968. However, theses diplomatic security locks didn't stop India from accomplishing its first nuclear test in 1974 or from Toshiba from selling computer guided systems to the USSR in the 1980's. From 1985 onwards, the "Australia Group" (2) would impose a regime of security checks, attempting to keep watch on their exports of chemical and biological products as well as their factories and equipment which produce dual-use products, to ensure that they did not contribute to the proliferation of chemical and biological arms (CBA). By that time, it had been proved that chemical arms had been used in Iran during the Iran-Iraq war. Iraq had notably obtained a large amount of the material for its chemical weapon programme from the international chemical industry.

In 1995, at the same moment as the " Wassenaar Agree-

concerning their exportation to non-member countries (3).

Since then, there have been three alternating sets arguments which are called upon depending on the current conflict of interests: the " realist " (concerned with the primacy of protecting the nation), the " neo-liberal " (prioritises the interests of bilateral commerce and exchange) and the " structuralist " (the liberal-democratic management of shared knowledge, which foregrounds and respects international treaties). But since the range of goods and technologies of so called dual-use has revealed itself to be too large, it has therefore been restricted to goods which are sensitive to particular political, strategic and security purposes: components, production or test equipment, software and know how, used or that could contribute to the development, production, manipulation, functioning, maintenance, storage, detection, identification or dissemination of chemical, biological, nuclear or other nuclear explosives, or the development, production, maintenance or storage of missiles which can be used as vectors for such arms. In principal, this definition doesn't include goods and technologies from the 'public domain', fundamental research, the provision of services or the movement of people. But the Abdul Qader Khan affair, the Pakistani agent who disseminated the technology of the nuclear bomb (to North Korea, Lybia or Iran), encouraged the nation states that control access to such armaments to look for new security guarantees to close the loopholes.

The arrival of convergent technologies or NBIC (Nano, Bio, Info, Cogno-technologies) into the military arsenal, opens new fields of operation for military supremacy and leaves little doubt as to the emergence of new forms of

The PM-3A was a small nuclear reactor that powered the United States's research base at McMurdo sound in Antarctica. It operated from 1962 till 1972, when a leak was found and the plant was decommissioned.

bling agents; technologies developed for individual treatment could be used for making chemical or biological arms that are selective (for example, according to genetic code); nano-composites open the way to firearms made entirely from plastic, undetectable, probably causing an intensification of security checks for material movement and knowledge dissemination; progress made in robotics and the electronic control of animals may lead to the remote manipulation of soldiers bodies.

The borders between civil and military, day by day, are more and more hazy in a climate of widespread war. It could be, that the development of dual-use convergent technologies give rise to export regulations entirely based on digitisation, cryptography and universal traceability

Freedom and machines

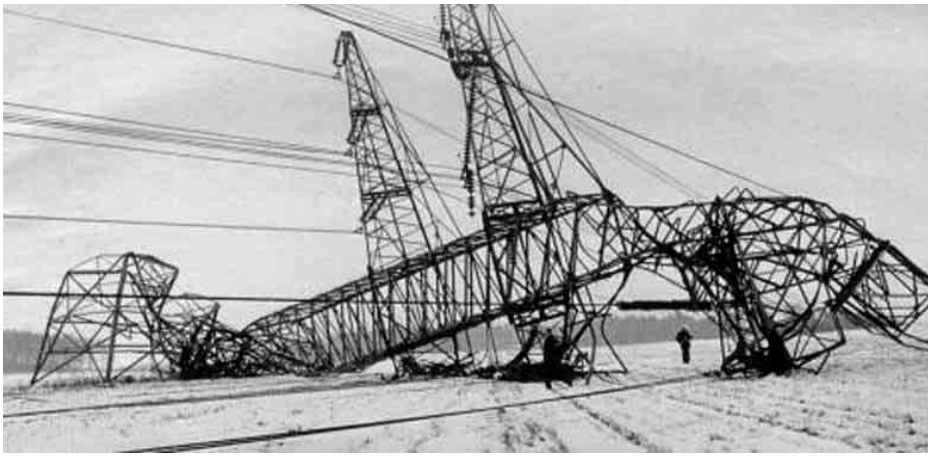
BY ANGE VALDERAS,
PHILOSOPHER

1. The freedom of action of machines

With the revocation of the dogma of the immortality of the soul (1), knowledge has acquired a cardinal position in the control of the human mind. The access to truth is no longer achieved through spiritual practices but along the indefinite road of knowledge. Divine fatality has thus been replaced by a real existence in which nothing is left unexplained.
In such an existence, there is an insoluble tension between the (ethical) freedom of the individual and the causality of knowledge, between subjective autonomy and objective heteronomy. This tension is expressed in the conflict between freedom of action and the physical, psychical, social or metaphysical obstacles that limit its exercise. In this, the tension can be understood as a biblical reminiscence, since *Satan* is the Hebrew verb for all that obstructs or hinders movement, the noun form of which was translated into Greek as *diabolos*, everything that leads us astray.
Just as knowledge, through its claim to bring about freedom of the mind against divine fatality, has merely substituted one fatality for another, thus transforming itself into an obstacle, so the power of machines, which it is claimed extends freedom of action, has only brought about new determinations. The automated *mule jenny* allowed employers to bypass workers' freedom after the large-scale strikes in the English cotton mills in the eighteenth century, whilst the automation of automobile production allowed employers to override the solidarity of workers in the United States after the 1960s; today, the progressive automation of bureaucracy allows the governing elites to bypass employee demands in the state sector (2). The increase in the liberty of action of rulers/employers finds expression in the destruction of the liberty of action of the ruled/employees, who, classified as machines, were shut in and yoked together with machines inside factories, before being thrown out of work and made obsolete. As a result, breaking or tampering with machines has been (and still is today) the founding act of the producers' liberty of action (3).
All new machine systems overturn the distribution of power in society. The revolution of the engineers in the nineteenth century, by establishing the railway and telegraph networks, gradually destroyed the face-to-face personal relations and interactions that structured small-scale craft production. This revolution replaced the moral economy of the craftsman, immersed in the concrete community and physical existence, with a moral economy of industry within an abstract and rational society (4). In the process, *fraternity,* the concrete social relation predating all social or economic organisation, was soon replaced by *solidarity,* an abstract social relation, a strategic response to the unity of employers' power, from workers divided by their work and specialisations. But once it was dissociated from the fraternal sentiment, the value of solidarity gave rise to an unalienable private sphere, exempt from the obligation to welcome the other in oneself (interiorising fraternal feelings). The transformations of subjectivity brought about by the advent of machine society went hand in hand with industrial development, and reached a new critical threshold with the automation of the 1950s and 1960s, destroying the social solidarity that resulted from the solidarity of functions within industrial production lines.
Now part of a planetary technical network, machines have come to shape the scope of possible government action, the way they produce and the way they view their freedom of action and will. That is why the network of machines now has a freedom of action and will, the end result of which is an increase in its own performances.

2. Possession by machines

Free will is here that of the *rationality of capital*. Since capital is dead labour (5),), the rationality of capital is therefore the rationality of dead labour. This labour, crystallised in machines and symbolic structures, acts like a vampire, sucking living labour and robbing it of its freedom of action.
Whereas in craft society, the weight of death and its power were manifested in custom or myths, in industrial



Action against power lines by Marco Camenisch on the 25th june 1985. Camenisch is currently held in the prison-fortress of Thorberg, in Switzerland under a mode of total insulation.

But these production and consumption sites are not only "large cemeteries under the moon". Because machines have not only incorporated labour, the energy of a multitude of workers, but have also incorporated and crystallised their will and imagination.
Certain particularly elaborate crystallizations of the will and the imagination take the form of artificial creatures, forms of artificial life ruled by a "digital evolution" (6). These creatures are able to learn from their own experience and to determine their own goals in a given environment, independently of human supervision (7). They can be compared to the magical creatures called *tulpas,* generated as exercises by Tibetan sorcerers. Tulpas, material forms conceived by the mind, are not phantoms or visions but phenomena doted with physical substance, animals, objects, landscapes or human beings, able to produce sounds or smells.
Yet the difference between artificial, mechanical creatures and *tulpas* is immediately clear. Because what is only a means or an exercise for Tibetan sorcerers, who consider the material world as an illusion, is an end result for the sorcerer from techno-scientific societies, who considers the material world as real. The apprentice sorcerer, having created a *tulpa* by concentration and control of his imagination, invokes it and then frees it by an act of consciousness that also destroys it. He thus realises that it is only a creation of his imagination. The goal of the exercise is to end up disbelieving the creations of one's will and imagination, but such disbelief must never come too soon, since otherwise the pupil would miss out on a part of his training aiming to make him bolder. But when they perceive the frightening apparitions of the *tulpas* they have created, most novices are terrorised and sometimes die. Alexandra David-Neel spoke with a hermit from Ga (eastern Tibet) on the subject. If the sorcerers' apprentices had died of fright when faced with the objectification of their own thoughts, would it not be enough, she asked, not to believe in demons in order to avoid being killed by them? But the anchorite answered: "In your view, it should also be enough not to believe in the existence of tigers to be sure of never being eaten by one, if a tiger happened to come near (…) We must know how to defend ourselves against the "tigers" we have fathered, and also against those created by others." (8).
Because their cosmology does not allow it, the sorcerers of techno-scientific societies, unlike their Tibetan counterparts, apparently make no attempt to escape from the creatures they have created. On the contrary, they industrialise them, replicate them and increase their size without worrying about the terror they provoke. Here we can see the importance of the psycho-cultural framework for the definition of possible freedom of action and for the perception of the world it generates (9). That is probably why the use of forms of consciousness developed in psycho-cultural environments differing from our own (like that of Tibetan sorcerers) allow us to see, in the techno-scientific practices of imperial power, the presence of entities or forces that our psycho-cultural frameworks hide from view.

Max Weber described disenchantment as the imposition

powers to the surface, to objectify the objectifying relation of objectivism, we are not criticizing rationalisation, but radicalising it. That is why, although the elaboration of concepts of an essentially different nature from those of dominant science would allow us to establish essentially different facts, freed from the particular historical formation responsible for repressing mythic powers, nothing allows us to believe that *knowledge* of these facts would actually free us from the myths and powers that haunt them, nor even that it would allow us to overcome the gap between techno-scientific progress and moral progress (11). What is more important here is to establish other kinds of technology that do not pose the relation of the subject to the world through knowledge, but cause another world to emerge than the one we now know.

NOTE

(1) - In fourteenth century England, the Lollards' affirmed the doctrine of the mortality of the soul. It is likely that we can see in this affirmation a necessary condition for emancipation from the power of the Church. But with the development of knowledge, the issue of immortality was transferred from the soul to the body, then from the body to machines.
(2) - Marx in Book One of Capital describes several workers uprisings against the introduction of machines: "In the 17th century nearly all Europe experienced revolts of the working people against the ribbon-loom, a machine for weaving ribbons and trimmings, called in Germany Bandmühle, Schnurmühle, and Mühlenstuhl.(…) No sooner had Everet in 1758 erected the first wool-shearing machine that was driven by water-power, than it was set on fire by 100,000 people who had been thrown out of work. Fifty thousand workpeople, who had previously lived by carding wool, petitioned parliament against Arkwright's scribbling mills and carding engines." (Marx, *Capital,* Vol. 1, Part IV, Chapter XV, Section 1).
(3) - A few decades ago, Gandhi, striving to conserve the values – the moral economy – of the village and the craftsman in the face of British industrialisation, pursued in the Indian context the Luddite approach (Gandhi, *All Men Are Brothers*, 1960).
(4) - The moral economy of industry is the totality of moral norms that constitute the mode of regulation of industrial society (cf. E.P. Thompson, *Making of the English Working Class*).
(5) - *"Capital is dead labour, which, vampire-like, lives only by sucking living labour, and lives the more, the more labour it sucks."* (Karl Marx, *Capital,* Vol I, Part III, Chapter 7)
(6) - The digital evolution consists in letting populations of I.T. programmes evolve spontaneously in competition with each other to find the most appropriate solution to a given problem. This principle, called "genetic algorithms" was invented in 1975 by John Holland of the University of Michigan and the Santa Fe Institute.
(7) - "The ultimate goal of artificial life would be to create life in another substratum, ideally a virtual substratum in which the essence of life has been abstracted from the details of its application in any particular substratum. We would like to build models that are so similar to living things that they would no longer be simulations of life but would become examples of it." (LANGTON C.G., *"Studying Artificial Life with Cellular Automata"*, Physica D, 22, 1986, p. 147)
(8) - Alexandra David-Neel, *With Mystics & Magicians in Tibet* (1931)
(9) - Curiously, Einstein's critique, in the name of the theory of relativity, of a priori forms of sensible intuition (space and time), or Heisenberg's

General digitalisation or the "virtual" reduplication of the "real world"*

BY MICHEL TIBON-CORNILLOT, ÉCRIVAIN, EHESS

In these few lines we deal with the dreams and nightmares of our culture in its scientific, technical and industrial version, the final stage of modern Western society. These dreams, we shall see, find their first area of incarnation in powerful machines, computers, televisions and cameras, which all point towards the affirmation of the diaphaneity of the whole universe. But one must bear in my mind that this imaginary work cannot take on its full dimension, its "real" existence, without the underground or explicit work, without the frenzied and perpetual activity of all its actors aiming at modifying/transforming the "real" in its totality.

On the internet of objects and organisms: the realisation of the universal " panopticon

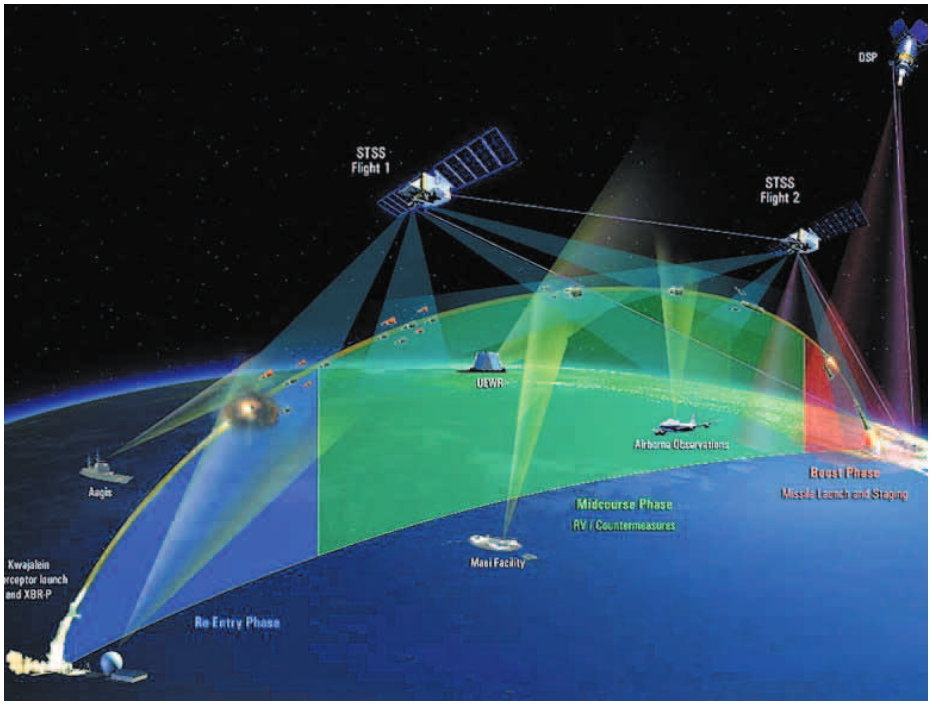
Biometrics is a highly sensitive indicator of powerful processes at work in industrial societies, processes linked to "general digitalisation", a kind of general mobilisation of figures. This extraordinary project aims to attribute to everything that exists, to all objects and organisms, to the entire planet and everything it contains, "mathematic" signs and structures. The project is not new and its application to the human body is a dream that has already been partly realised in the modern armed forces, in the health sector and the police service, whether in anthropometry, social security, the census or classification of army recruits. But biometrics reveals other essential and totally new aspects, i.e. its correlations with networks of motorised, logico-mathematic automatons: computers.

If we look at the conventional definition of biometrics, we can describe it as "all the processes that consist in giving a digital imprint to a person's physical characteristics (iris or retina, voice, fingerprints, hand or facial shapes). The aim of a biometric system is to authenticate and identify individuals. Unlike other techniques with the same aims, but which allow what people own (a card, badge, etc) or what they know (password, etc) to be measured or checked, biometric techniques enable what we are to be measured and recognised (1)." Biometrics involves two kinds of controls: the physical and behavioural control of the individual (2).

The most important term in this definition is *digital imprint*; it helps us distinguish older anthropometrics from contemporary biometrics, the existence of which is based on the fundamental matrix, the immense legion of 850 million computers (3); biometrics thus follows digitalised parent systems (electronic surveillance systems, telecommunications, health, etc.), that is, all the systems and/or networks that can be digitalised and interconnected with other dossiers and files inside computers and computer systems. In a mere two years, there will be a billion computers, an impressive figure if one considers that the network has been set up within the last thirty years.

These networks and interconnections between computers constitute the internet as we know it today, mainly disseminating and processing signs, texts, sounds and pictures. The internet also supplies the context within which classic biometrics has evolved, at the crossroads of present-day performances based on an increase in digitalisation in each of these domains. This then is the first level of digitalisation, in which the majority of socio-economic players in industrial societies must take part, both actively in their professional environments, invaded by the use of computers, and in a deeper and more passive way by accepting more or less freely ever tighter and more efficient controls by digital machines that have been given the task of keeping watch on them.

Among the new possibilities, contemporary biometrics has been developed alongside the digitalisation of pictures, of photographs of faces and/or parts of the body, such as the palm of the hand, fingerprints, irises, etc. The association of these digital visual data with texts describing the identity and biography of individuals constitutes nominal open files, of which the data is cumulative and, above all, whose dissemination can be more or less restricted. Such are the current achievements of the *internet of signs, sounds and pictures*, the development of which has provoked upheaval in pre-existing sectors such as public and private security, health and the media and has led to the creation of new centres of activity, such as I.T. training, software, research and computer-editing development, training in image and digital sound, etc (4).



Panopticon of the american army : monitoring the planet to act in real anywhere in the sky and on the earth

Towards the digitalisation of all objects and organisms in the "real world"

Yet the power and dynamism of such performances do not exhaust the imaginative possibilities of general digitalisation, which is in essence unlimited. The undertaking is driven by a tension towards infinite digitalisation which, through the use of increasingly powerful automatons, has the task of digitalising the totality of objects in the world. That is why the project of an internet of objects and living organisms has been established little by little, thanks to the fulfilment of a number of vital conditions.

Although the issue at hand is to visualise digitalised information on computers, this information does not in fact have the same status as the aural, textual or visual by-products of these motorised logico-mathematic automatons. In the new kinds of internet networks, the primary aim is to collect and locate all the objects and living organisms existing in the "real" world and to attribute to each of them, on the one hand, a specific identification address and, on the other, to enable them to carry labels in the world of things and beings, such as the RFID (Radio Frequency IDentification) microchip. Most everyday objects that carry barcodes are being replaced by these contactless chips that can be read from a distance by digital sensors connected to their interconnected matrixes, computers. Permanent updating of these labels and the tracking of their whereabouts are enabled by attributing to each object or living organism one of those well-known ID addresses that now identify each computer within the present-day system and by enabling them, via digital technology, to be used in GPS (Global Positioning System) systems.

Many applications for these increasingly miniaturised microprocessors already exist, whether it is in the field of health, banking or the military context, to name only these sectors. We might note that in Australia, all banking staff are automatically implanted with microchips and that the same is true of military personnel. If we try to put a figure on the microchip market, it is reckoned that in 2008, sales in the identification of medicine, baggage, animals, books, tickets, etc. will amount to 6.8 billion RFID labels (5).

Towards a "planetary" and ubiquitous code

These microprocessors are being implemented before our eyes and their almost miraculous multiplication is invading all areas of society. But the description of developments in terms of their usefulness, whether in economic, commercial or health terms, does not do justice to the totality of the project. In fact, inanimate objects and living organisms marked in this way can only enter into the dance of the *internet of objects and organisms* if an ID address (7) can be attributed to each individual within these innumerable legions. It is at the price of this convergence between the "real" destiny of each object, of each organism, and the computerised trace of each of them in the interconnected com-

centre – the "Ubiquitous ID Centre" – have developed technology enabling them to obtain "a unique identification code, which, when applied to 'real world objects,' makes them easy to read on a computer." This ucode could replace many different codes that are applied to objects, whether they are Japanese or European inscription codes of objects or existing standardisations. Each individual object can be inscribed with an ID address since the capacities of this new code are gigantic. The basic 128-bit code can be extended to 256, 384 or 512 bits. If we only consider the 128-bit figure, 34×10^{37} codes (34 followed by 37 zeros) can be attributed to it, that is, a billion labels can be attribu-

to *allow for the creation of ubiquitous computing environments*. This time the aim is to bring to the traditional, heavy, in short, rather stupid, real world, new, radically digitalisable objects that can be added more and more successfully to the general panopticon that is being created. Here a new element appears which can help bring out another essential link in the general digitalisation project: **the reconstruction of the "real world".** The "panopticon" can only be set up in the social fields that have previously been "rationalised, formatted", and which are ready to receive the good news of the progress of digitalisation. This is the point we must now examine.

NOTES

(*) This text deals in more detail with elements of an article entitled "Se souvenir des mondes vivants" ("Remembering living worlds"), published in the proceedings of the symposium "L'habiter dans sa poétique première" ("The living in its first poetics"), Cerisy, September 2006, Ecole des Hautes Etudes en Sciences Sociales (EHESS).

(1) Cyrille Louis, La France entre dans l'ère biométrique, Le Figaro, 12/06/03.

(2) Frédéric Mascre, La biometrie comme méthode d'authentification : enjeux et risques (Biometrics as Method of Authentification: the Stakes and the Risks), Echanges, 01/05/2003. The characteristics collected "must be universal (existing in all individuals), unique (allowing for the differentiation of one individual from another), permanent (enabling evolution over time), recordable (collecting individuals' characteristics with their agreement) and measurable (enabling future comparisons)."

(3) This is the number of computers used in the world in 2004 according to Computer Industry Almanach (CIA), an American market research consultancy in the IT sector. The figure should pass the symbolic one billion mark in 2007.

(4) Daniel Poulin, Un point de vue nord-américain sur Internet et ses enjeux (An American viewpoint on the Internet and its stakes), April 1996, on the site :
www.lexum.umontreal.ca/conf/technologie/fr/textes/sgml/vue.html. In this text, the author gives a highly dense summary of the movement that has led to the setting up of standard contents on the present-day internet: "Highly diverse informational worlds have thus been united on the digital terrain of the computer. The consequences of this digitalisation are considerable. One of the first is that from now on the PC will no longer be limited to figures and words. If it is powerful enough, it can reproduce music with a very high fidelity, display videos, allow for the organisation of videoconferences or phone conversations. The development in speed and capacity of PCs, notably their capacity to manipulate sound and pictures, has placed these machines at the heart of the phenomenon of media convergence."

(5) The text is available in French at the following address: C:\winword\Biometrics06\RFID, IMPLANTS Le meilleur des mondes (Page 1) - PC INpact.htm

(6) On today's internet, computers can be linked using the IP protocol (Internet Protocol) which uses digital addresses called IP addresses. IP addresses are generally 32-bit addresses, usually written as four whole numbers. Two parts of the IP address are distinguished: a part of the numbers on the left designates the network and is called the ID of the network (NetID). The figures on the right designate the computers of this network and are called the Host-ID.

(7) This text, presented by the Ubiquitous ID Center, can be found at the following address: http://www.uidcenter.org/english/uid.html:
Unique identification for all objects
The most fundamental element for ubiquitous ID technology is the unique ubiquitous identification code (ucode) assigned to real-world objects in a format easily read by computers. This enables computers to automatically recognize real-world objects for processing guided by an awareness of the context.
There are currently many different code systems applied to objects at work in the distribution sector and other fields. For example, JAN codes, EAN codes, and UPC codes are used in barcodes, while ISBN codes are used for books and other publications. (The abbreviations stand for Japanese Article Number, European Article Number, Universal Product Code, and International Standard Bibliographic Number, respectively.) These codes are assigned to types of products, so the ISBN assigned to a book "Botchan" cannot be used to distinguish individual books within this category. In contrast, the ucode system is fundamentally a means of identification for individual objects. This system provides a way to identify each book "Botchan" stacked flat in a bookstore or each bottle of wine in a liquor store with individual ucodes. The unique codes assigned to each object can be especially significant for items such as food or medicine with distinctive characteristics and expiration dates. It can also be used as the basis for information services.
ucode: 128 bits long
As a code, the ucode is 128 bits long and can be extended as needed in 128-bit units to 256, 384, or 512 bits. With 128-bit numbers, 340,000,000,000,000,000,000,000,000,000,000,000,000,000 codes can be assigned.

(8) Le texte anglais complet de cette définition se trouve à l'adresse indiquée plus haut du Ubiquitous ID Center:
"The goal of the Ubiquitous ID Center is to establish and spread the infrastructure technologies for automatically recognizing "things," thus allowing for the creation of ubiquitous computing environments. This has been a long standing goal of the TRON Project since it was officially launched in 1984, and Ubiquitous IDs (uIDs) are essential components for realizing them. These infrastructure technologies include not just the specifications of chips for radio frequency identification and/or contact/non-contact smart cards, but also those for reader devices plus a 128-bit identification numbering scheme, the numbers for which will be allotted by the Ubiquitous ID Center. Validation testing of the electronic IDs is scheduled to begin in April, the Ubiquitous ID Center said."

(9) M. Foucault – Discipline and Punish; on the panopticon, see chapter 3.

A Worst-Case Scenario

by Gerold Yonas and Curtis Johnson, Sandia Lab*, *May 19, 2005*

In military applications, we envision the remote deployment of swarms of microrobots that are available to locate, track, target and destroy people and machines with little human intervention. For more complex applications, swarms will be guided by groups of people who are enhanced with mental and physical prosthetics and advanced collaboration tools to enable exceptional rapid collective decision making in dynamic, confusing and ambiguous situations.

This human-machine swarming collective will migrate from military applications to peacekeeping and law enforcement and then to other sector applications, such as remote monitoring, security, and maintenance of complex machinery and infrastructure.

Small numbers of terrorists or criminals will be able to inflict massive damage on society, including the use of diseases bioengineered to resist treatment and affect only target populations.

Information offense and defense will advance rapidly so that attacks on systems could become continuous and widespread, and lead to frequent identity theft, and the destruction of public confidence in government and financial systems.

New missile defense methods will be easily overcome or bypassed with missiles launched from short distances or with low-signature air-breathing global attack platforms that can deliver WMD to any place on the planet.

Amidst widespread fear of death and destruction, societies will turn to tough, strong protectors as their leaders and will be willing to accept totalitarian states in exchange for the security they promise.

Bloodless combat will also emerge, with energy beams and chemical and biological agents developed to attack or manipulate the brains and nervous systems of individuals or groups with various levels of temporary and permanent damage. This will enable victory without damaging enemy hardware or infrastructure; this is "politics by other means" taken to its logical extreme: changing minds directly.

As we write, people are fretting over their electronic privacy in exchange for convenience and connectivity.

Advances in electronics, computers, and communications will enable the deployment of thousands to millions of networked sensors to track anybody or anything anywhere affordably and covertly.

Such networks will be able to understand emerging situations and initiate appropriate communications and actions. These networks will have universal application, from calling in hypervelocity precision strike weapons to discovering the whereabouts of devious teenagers.

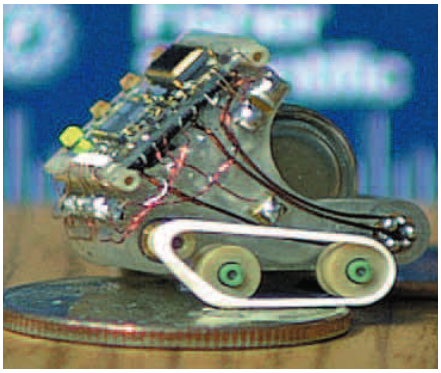
Sensor networks will eliminate anonymity and fundamentally alter public/private boundaries, reducing individuality and creativity and leading to centralized manipulation and control of societies. Armed with precise awareness and new ways to control people with and without their knowledge, dictators will exercise stifling control and will be very difficult to resist or overthrow.

New forms of wearable networked computers will provide personal enhancement, artificial pleasure, information, and instruction. These technologies could create interconnected societies or, alternatively, leave us sitting isolated at home enervated and mesmerized.

Neural prostheses will be used for pain relief or pleasure creation, and individual use of these devices will further limit the productivity and motivation of individuals. The external control of these devices can provide a method to influence or dominate others.

Treatment or prevention of disease based on advances in biotechnology will provide means to extend the lives of the elderly and even preserve the lives of the critically ill leading to increasing costs of health care and a drastic reduction in the opportunities and flexibility available to younger generations.

New methods of retroduction or cloning will result in engi-



A team of the Sandia laboratories based in Albuquerque, New Mexico, developed a micro-robot which, according to the company, could be the smallest autonomous robot in the world. They wish today to equip the robot with a mini-camera, a microphone, a communication system and a chemical sensor. Working in swarm, it will be able to communicate with its congeneric and with its originators, via a relay station.

grow under natural conditions without limits will cause unexpected environmental changes. Nuclear proliferation will accelerate and nuclear explosives will be available and used for extortion as well as occasional attacks.

As the global climate begins to change rapidly for poorly understood reasons, the most fragile societies will not be able to adapt, and this will lead to economic collapse, the spread of infectious diseases, and mass migrations to neighboring states.

Fear of migrants with untreatable diseases will lead to genocidal methods for self-protection and increased isolation of even wealthy countries. Many nation states without economic sustainability will revert to tribal governance.

Rapid fluctuations in climate will deplete stored water supplies and prevent crop production leading to famine. Compact distributed nuclear reactors will be built and deployed to deal with the escalating energy and water 3 needs, but they will be

Governing the global home

Sophie Gosselin
and David Guignebert,
association Constellatio

" The global home " is under the threat of devastation. [...] Politicians are responsible for the future."
Jacques Gaillot (a man of God)

The imbalances caused by technico-scientific developments to the world's eco-system during the 20th century have driven citizens and scientists to call on politicians to react by seriously addressing the new ecological deal. At the moment, we can note that politicians as well as transnational corporations (1) are slowly beginning to integrate the ecological dimension into their plans.
The political parameters of their global and long-term strategy now tend to be organised around this new dimension. They talk increasingly of 'sustainable development', 'respecting bio-diversity', 'fair trade', 'ethical investment,' in the fields of economy, culture or health (2).

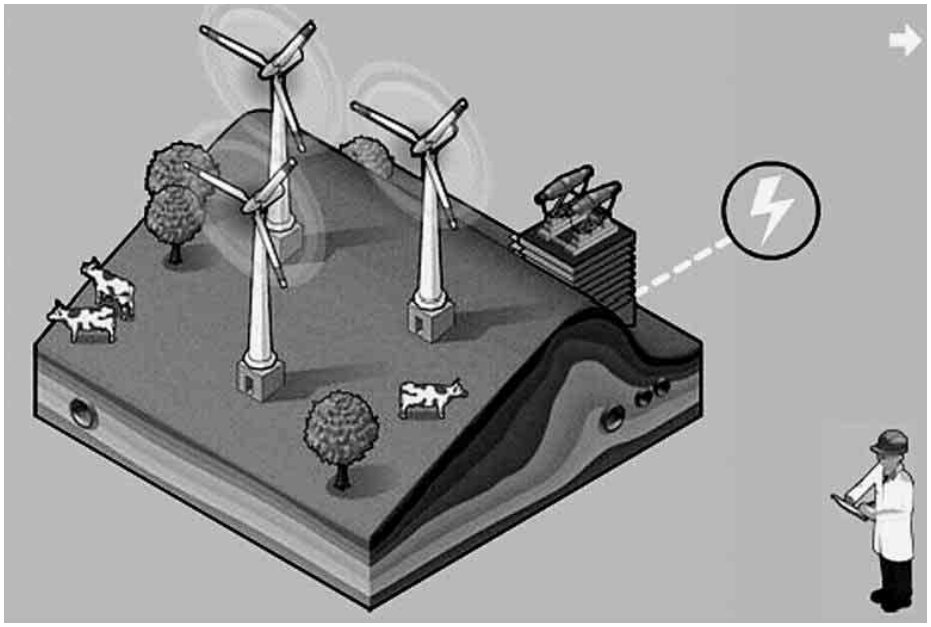
Ecology is becoming a political imperative, issuing its own summons : Humans, be responsible and take care of this world where you live and which you are destroying ! Humans, face your destiny collectively !
But, this passage from an everyday, individual, personal responsability to a collective one, this move from an ethical to a political mode, through the ecological stake, does not just respond to an ideological function by the recuperation for the dominant minorities of a discourse or a practice that used to be subversive. It redefines politics, what we used to call 'politics' and 'ways of doing politics'.

With the concept of 'biopolitics', Michel Foucault introduced a new analysis of the transformation of these 'ways of doing politics' over the last two centuries. Biopolitics is the 'way of doing politics' of the government, of governance, and it finds in the (neo)liberal theory the basis for its implementation. This political mode involves managing populations, considered as a living resource. Life has become its assignment (3). But, even though this political practice has grown in the 20th century, we think it is now being challenged by the new eco-logical deal.

In the passage from national to regional politics, experimentation is the command that governs the reshaping of the democratic frame. The citizen now has to be 'consulted', to allow for her/his 'greater participation' in the city's democratic life. 'Sustainable', 'diversified', 'fair', 'ethical' politics seem to go together with the imperative to become 'participative' as a new mode of integration of citizens. The citizen finds her/himself ever more embroiled in the field of politics, of eco-politics.

We attempt here to define a concept of eco-politics that differs from the notion of ecological politics, as it was defined by some thinkers, such as Ivan Illich, André Gorz or Cornelius Castoriadis, at the advent of the Information Age. We do not wish to propose or formulate a new political theory, but to analyse a new technology of power, to study the implementation of a new political logic, theorised in terms of ecosystemics (4) and later recuperated more or less efficiently, by a whole series of political contructs, either mainstream (following the 'sustainable development' model, for example) or alternative (of political ecology, mostly on the extreme left). If politics is the practice which enables us to find ways to organise our collective existence, then our approach to the political question goes against any attempt to construct a political *model*, i.e. to conceive of a system that integrates a priori the plurality of conditions that make collective life possible.

Insofar as ecology implies that the various levels of interaction between what is living and the environment be taken into consideration, it relies on an ethical mode which states that the individual is related to her/his milieu (either social, environmental or psychic) and thus finds himself committed to a certain behaviour and to specific values. His/her own singularity in the world is at stake.

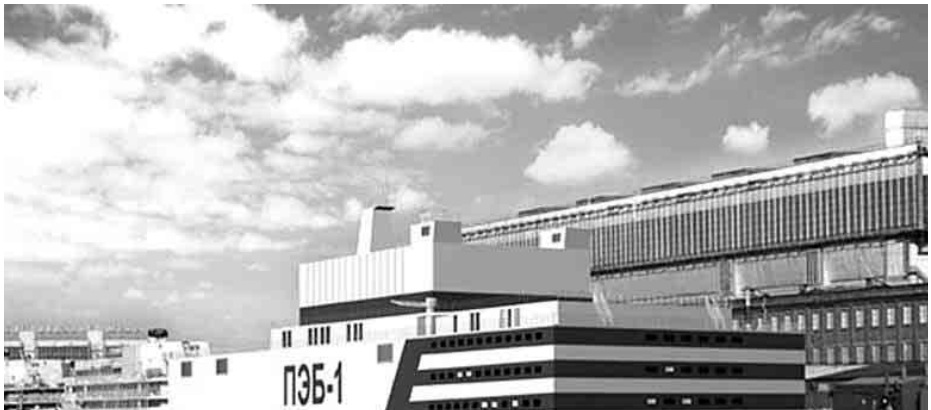


The "wind farm" managment on the Areva website, the world leading company in nuclear energy. The real is presented a a big lego.

good intentions, you'll never be able to consider all the implications of your actions... So you'll have to let 'us' manage; we, the politicians, we'll control all your movements with the help of self-regulating devices indispensible for your collective security. This paradox is best expressed through the large diffusion of oxymorons bringing together two conflictual situations in a single element that upsets our ethical position: "industrial / ecology", "fair / trade", "ethical / investment", "clean / energy", etc.

The paradoxical consequence of this political handling of the ecological question is to remind each person of their responsability, asking her/him to self-regulate and keep every single one of her/his own movements under control, to picture him/herself at any time in a global vision of the world, of the global ecosystemic mesh, to respond adequately like a good "follower" of the lay religion of Ecology, and at the same time discharge her/him of any personal responsability, preventing her/him from deciding for her/himself by imposing a global management. From there on, politics will install all the proper conditions to regulate everything and welcome everybody, to manage the household economics, the global *oikos* (7).

In this passage from ethics to politics, or rather in this integration of ethics into politics through ecology, technology is an esssential element. The collective management of individuals by politics is now carried out by security devices to control and regulate their behaviours, to avoid potentially harmful interactions, thus transforming the world into a gigantic "machine for living", an enormous evolving and adaptive structure that is forever adjusting to the latest parameters, detecting and correcting any deviance (8), incorporating the new information that is likely to upset the ecosystem or divert the proper circulation of flows.
The world is now becoming unified through the technology of eco-political power, under the rule of logos, managed as a general economy of energy flows. We are witnessing the birth of an oecumenical policy, taking eco- as a shrine and eco-nomy and eco-logy as main cults and liturgies.
Internet, originally a polemological technology developed by the Pentagon, has become the most efficient medium of diffusion of this general integration, of this oecumenism; it now infiltrates all human activities, from the most intimate and private to the most public (9). Thus, politics makes the use of technology an obligation, provoking the fear of ending on the wrong side of the "digital gap". Everyone has to be connected, or will fail to participate in the general information exchange, in the global economy of the eco-system.
Internet has become the state's most efficient way to regulate its system of control. It digitalizes us, the citizens of the eco-political world, it produces digits - digital encoding of life and the related processes.
Eco-politics, allied to technology, becomes a paradoxical religion, which, while seeming to address our sense of individual responsibility, tends to negate, through technology, any sort of moral examination.
Self-regulating control through technology confronts us with anonymous devices which have already chosen for us, already decided what is good for us. We are confronted with locks, likely to open or close, to authorize or proscribe any action we may wish to undertake. For your sake, for everybody's safety, to keep the system going, we install



locks (10) in all the digital codes to stop you carrying out this or that specific action.
You will be technically (not morally, not legally) constrained to respect the law. Your only room for maneuver will rest on your possession (or not) of the code that gives you access to this or that possibility. The machine for living thus becomes a mechanics that defines your options in advance.
The integration of ethics into the political thus calls for the annihilation of ethics itself.
We will no longer be able to experience, to feel, awkward, ambiguous or conflictual situations, which confront us as ethical or moral beings. The securitarian rule is the negation of individual ethics, the negation of morals as that which allows destabilization, confronting you with heterogeneity. We are in the realm of equity and identification . Figures (digits) (11) have to be dealt with, balanced, compared, by constantly weighing and measuring, through statistics, opinion polls and marketing.

"Spare yourself" would be the new eco-political injunction: you can take risks, but be insured (insure your life, your car, your home, ...), "spare yourself" when you face new experiences, or the problems of life : moral dilemmas, hardship such as illness (physical or psychic), accidents, job loss, separation....
"Save yourself", save your money, your sperm, your data. To each economy, its own bank: Financial economy, life economy (sperm bank), memory and knowledge economy (data bank).

In this securitarian shift, eco-politics extends and incorporates biopolitics. Our relationship with the world is defined in the consumerist mode and public space becomes an extension of home. We live in the realm of the "cell". Man is no longer in God's image, but in the image of her/his eco-system : a living cell. And the world is now a gigantic organism, society a vast autopoietical process, subordinating production (poietics) to the law of reproduction, ruled by self-regulation and self-generation.

Challenged by the integrative dynamics of eco-power, of its increasing control over every aspect of our lives, of our existence in this world, the traditionnal modes and practices of political resistance are radically called into question.
Political resistance movements have so far believed they had found ways to topple established regimes by building alternative political models. But by doing so they had to adopt the point of view of those in power, to occupy the same position after their takeover, and to follow the logic they had previously scorned. Does resistance to domination mean resistance to a specific regime ? Or should it rather signify resistance to a logic, a logic of domination? This resistance should then oblige us to invent new dissenting political practices, by inventing a poietics which would shatter the mechanisms of the technology of power (12).

Extraterrestrial Biopolitics and Creative Industries

Par Konrad Becker,
Global Security Alliance

Global media and business networks create a planetary environment for geopolitical experimentation with global parameters of life - and death. The "Grand Chessboard" of the geo-strategic world has expanded to outer space and inner space. Conflict management has migrated into the military entertainment complex, the domain of culture, media and the creative industries.
The space age began with a grand media spectacle. In the 1960's, for the first time in history, planet Earth was emerging in the consciousness of a global audience, terrestrials on a pale blue dot in the vastness of the skies. But the innocent picture of Man on the moon was diverting attention from an advanced weapons program for the militarization of space. The rockets of the United States space program and the Soviet Union's Cosmic Troops were based on the V-2 ballistic missiles of World War II. In 1945 Wernher von Braun and his team, who developed and manufactured the V-2 based on slave labor, were brought to America. This operation named Project Paperclip included scientists linked to human experiments in concentration camps. Nazi military officers were at the core of Defense Department projects that centered on carrying military personnel up into space and moving them around, but also on the use of robotic weapons in orbit, nuclear missiles and the setup of armed "Death Stars".

Dr. Werhner von Braun, then Chief, Guided Missile Development Operation Division at Army Ballistic Missile Agency (ABMA) in Redstone Arsenal, Alabama, was visited by Walt Disney in 1954. In the 1950's, von Braun worked with Disney Studio as a technical director, making three films about space exploration for television. A model of the V-2 rocket is in background.

In the 1950s the Army's missile program and later NASA's space program began a concerted effort to sell the idea of space flight to the American public and ensure adequate funding of the space program. Walter Elias Disney, an ardent supporter of right-wing politics, joined Wernher von Braun to sell terrestrial audiences on the idea of space. When they communicated a vision of space in simple terms but with the authority of science, audiences became moonstruck. The same year von Braun worked on Disney TV programs about "Man in Space", "Man and the Moon" and "Mars and Beyond", Disneyland opened its doors. In 1955 Disneyland became a milestone in the exploitation of the human imagination, an environment where people enjoy being manipulated. Visitors to this experimental theme park happily indulged in artificial cheerfulness that was comfortable, reassuring and very well operated. Disney, an early sympathizer of the American Nazi movement and a main figure in McCarthyism's Hollywood witch-hunt, developed a model of experimental psychological totalitarianism where subjects gladly settle for containment in an artificial illusion of power and autonomy.

In 1960 the rocket development center was transferred from the U.S. Army to the newly established NASA and von Braun, converted to a born-again Christian, became director of the Marshall Space Flight Center. Even though programs were shifted to a supposedly civilian organization they have never been much about science or space exploration. Apollo missions were driven by a military offensive in support of ideological domination and today's Space Shuttle design has its source in Third Reich research for an orbital bomber plane. Military strategies in the 1990's confirmed space as the "real priority for national security" and concepts for new exotic weaponry advanced. Recent projects focus on networks of space-based lasers, directed-energy cannons, radar satellites, exo-atmospheric kill vehicles and a range of other projects including high-powered global non-lethal weapon systems.

When humans went to space for the first time in history, a mission to the terra incognita of the human mind had a lift-off too. At the very same time when technology extended the arena of human conflicts into outer space, the mapping of inner space and the policing of the cognitive act was skyrocketing. The first mind control projects in the 1950's simply aimed at finding ways to force and to prevent unauthorized extraction of information. Programs for colonization and militarization of outer space have gained momentum synchronously with the quest for counterintelligence truth serums in the 60's. When rockets were launched into space, the first mass production and large scale involuntary testing of psychotropic and mind-altering drugs took off as well. A series of exotic psychological experiments were initiated alongside a massive diffusion of psychoactive substances worldwide. Secret human tests evaluated the offensive uses of unconventional interrogation methods, including hypnosis and sophisticated combination of drugs. Experimentation with human guinea pigs extended to practical try-outs on the lethal dose of LSD for a bull elephant. Donald Ewen Cameron, a

NOTES
(1) For example:Vivendi with " Veolia environnement ".
Cf. the 2nd 'colloque de l'Appel de Paris' - 9
(2) November 2006 - UNESCO (Paris). Organised by ARTAC in collaboration with HEAL and CHE : " Environnement et santé durable : une expertise internationale ".
(3) Foucault, The Birth of Biopolitics lecture at the Collège de France in 1978-1979.
(4) Coming out of the encounter of modern cybernetics and systemic theories, within the militaro-industrial complex in the United States, the arsenal of democracy during WWII
(5) Cf. http://fr.wikipedia.org/wiki/Approche_%C3%A9cosyst%C3%A9mique (in French)
(6) Cf .http://en.wikipedia.org/wiki/Systems_science (in English)

Continuation of the article "Biopolitique extra-terrestre..."

nical and ideological link between these programs for supremacy in outer and inner space.

The successful collaboration of Walt Disney and Wernher von Braun, Disney's expert on the "World of Tomorrow", was deeply emblematic as it represents a historic point in time and the beginning of a new era of geopolitical domination beyond the planet. It marks the chemical wedding of technologies of war and the mind, the conception of cosmic warfare and the birth of the new military-entertainment complex. Pong, the first videogame ever, developed at Brookhaven National Laboratory in the late 50's, was based on missile trajectory plotting; and the first game for a digital computer in 1962 was named Spacewar. The digital entertainment of today has its source in the massive investment in cold war military research and computer science. By now technologies of warfare, war games and combat training, 3D simulations and recreational computer games have converged on many levels. The marriage of the security complex and the entertainment industry is breaking the ground of what experts consider the future of post-human conflict management.

Disneyland and the global media sightings of men on the moon are exemplary for the universal power of imagination management and the spectacle. Receptiveness for the spectacle is deeply embedded in human desires for excitement, stimulation, knowledge acquisition and the construction of self esteem. Largely based on the biocybernetic exploitation of human response mechanisms that influence emotion, excitement and thrill, the technological spectacle in its play with danger and disorientation is rooted in the biology of ancient neural patterns. But its arena has been dramatically extended through technology. The machinery of the spectacle generates affect by triggering failures of orientation and control. This can be loss of physical balance, a rollercoaster ride or cognitive dissonance. The intensity of affect is directly correlated with the depth of disorientation and the more that vital human response structures are touched, the deeper the effect. Contextual parameters of relatively secure environments allow appreciating these disorientations as hedonistic experiences instead of discomfort and panic. These mechanisms trigger delight and numinous experiences, moving and enthusing audiences.

The 18th century political economist Adam Smith based his lycanthropic mythology of social order on "invisible hands" and fear. The business of politics historically implied a delicate equilibrium of hope and terror but with the end of the bipolar world of the cold war, the balance of devices to uphold authority tipped from positive to a negative reinforcement stimulus. In the 21st century, the social engineering of dread and longing evolved into a bio-political arena of terror and a psycho-political culture of internalized domination. The globally deployed technology of the spectacle transforms to a creative panic industry, the pacification of the self and the silencing of multitudes. With no visible alternatives to universal pan-capitalism there seems to be no need for payoffs for the disenchanted, no necessity to bribe the dissenting segments of the population and no incentive to grant extension of freedoms. Instead of peddling hope and visions of mutually shared commonwealth, authority is maintained by the production of synthetic fear and the need to secure property against some other. Deimos and Phobos, the gods of panic, angst and terror dominate the omni-directional realm of geo-psychological strategies in an asymmetric world war against invisible enemies without qualities. Market concentrations benefit neo-feudal power structures that know how to use access to media, private security and intelligence services to advance their interests. Private oligarchic networks of finance and business cartels cultivate relations to governmental entities controlling state agencies and military units. Media narratives and public relations strategies transform synthetic fear into advantages that produce windfalls of power and profit. This theater of fear is a skillful interplay of compartmentalized information units, privatized command centers, loyal officials and gatekeepers as well as professional Special Forces. Productions of artificial angst call for scenarios of counter-terrorist theater rehearsals and paramilitary actors as well as the professional staging of scapegoats and dupes. The dark networks draw on privatized intelligence units, so called "asteroids", business entities which provide cover for compartmentalized operations.

The extraterrestrial highway in the United States, is near the zone 51, a top secret area of the American army. In this zone "black projects" subjected to the secrecy defense are carried out.

Space was formerly known as heaven and manned space flight from earth could be understood as mechanical equivalent to an ascent to divinity. Johannes Kepler suspected paradise to be located on the moon and Konstantin Tsiolkowsky, the Russian pioneer of modern rocket science, saw manned space flight as a freeway to the supernatural. In his novel "Gravity's Rainbow" Thomas Pynchon contemplates the ambiguous interrelations between sex, rockets and magic. Jack Parsons, a key figure in American rocketry, lost his reputation and security clearance in obsessive pursuit of occult rituals and sexual mumbo-jumbo before he diffused into space in a lab explosion in 1952. A crater on the dark side of the moon is named in memory of Parsons, a tribute to the shady cofounder of the famed Jet Propulsion Laboratory (JPL). The 19th century spiritualist pseudoscience of a world of ghosts and occult belief in spirits, a complex adaptation to modernity, has morphed into 20th century sciences. From social theories and "optimization" of the workplace, from operations research to scientific communication and applied psychology, many genres of academic disciplines and the influence business are rooted in the twilight zone of the netherworlds.

When Norbert Wiener, who developed his work on cybernetics from ballistics research, writes that "Communication and control belong to the essence of

control which took shape in the 19th century on the basis of earlier procedures have mutated into new and aggressive forms, beyond simplistic theories of state and sovereignty. In the past, the science of power branched into the twin vectors of political control and control of the self. In the 21st century the technologies of material control and subjective internalization are in a process of converging. The traditional twin operations, with which the authorities aim to win the hearts and minds, the binding maneuvers of law enforcement and the dazzling illusionist control of the imagination, are transforming into each other. Not unlike werewolves using the powers of the moon for a violent metamorphosis, contemporary agencies of power turn into shape shifters and fluctuating modes of dominance. Star Wars technology shape-shifts into applications of creative industries, into the domain of desire, imagination and mediated lunacy. Technologies of individualization bound to controllable identities and the global machinery of homogenization are superimposing to a double-bind of contemporary power structures. The renaissance heretic Giordano Bruno anticipates these developments in his visionary treatise "De Vinculis in Genere" - a general account of bonding - on operational phantasms and the libidinal manipulation of the human spirit. The disputatious philosopher of an infinite universe, beyond his unique investigation into the imaginary and the persuasion of masses and the individual, also challenged the ontological separation

Planetary protection

BY EWEN CHARDRONNET
(AAA ROSKO)

The enthusiasm caused by the question of the presence of water or life on the planet Mars, fuels the controversy around the Mars Sample Return mission, which plans to bring back to earth Martian soil samples in order to analyse in laboratories. Members of the scientific community around the International Committee Against Mars Sample Return (1) deplore the inanity, even the danger of the mission.

The principal argument "against the red planet" is that there is no guarantee against the possibility of the earth being infected by a Martian form of life - either protein or bacteria based - although the problem has been imagined for years by the space nations. Even the first NASA missions put into affect the Planetary Protection Program, an arsenal of measures of biological protection, from the use of clean rooms (quarantine measures with a decontamination chamber) to diverse measures of analysis and exobiological research. Seen from the point of view of activists opposed to the Mars Sample Return mission, these measures of containment remain insufficient. They evoke the high degree of uncertainty that exists about such safety measures, on the Martian environment and on the electromagnetic and gravitational effects.

ICAMSR is committed to targeting the risks of particular space missions, brought together in a perspective which can be defined as "Exoplanetary Protection"; They are equally convinced of the necessity of protecting all the planets, situated within or outside our solar system, looking beyond just biological issues. Thus they consider the risks and consequences of the adoption of nuclear energy within spacecraft engines; whether for orbital propulsion, the exploration of our solar system, or for particular planets such as Mars or the moons of Jupiter, which are presumably covered in ice – but also the risks for our own planet; of crashes at lift-off or landing and the possible risks of orbital radioactivity returning to Earth carried by solar winds.

The feasibility of collecting samples from Mars has been regularly studied since 40 years: it is linked to the creation of a Planetary Protection resolution, initiated by the National Academy of Science, USA in 1958.

Planetary Protection Program

After the launch of the first Sputnik the 4 October 1957, astronomers began to imagine placing their instruments on spatial vessels in order to examine the minerals on the surface of the moon and other planets. With the advent of interplanetary rockets, one was made aware of not only the possibility of earth-based microbes to contaminating other bodies in the solar system, but also the possibility of contaminating earth on the return journey, meaning the arrival of exogenous materials into earth's biosphere. But the scenario was to remain prospective. The only rocket technology that existed at the time was propulsion based, and had only recently been validated. The 14 of September 1959, the Soviet Union announced a probe called Luna 2 which " crashed with success onto the moon ". To reach the moon during this era was an enormous success for the engineers. The Soviet Union provided no documentation to the USA about their planetary protection protocol other than a verbal assurance that the surface of their vessel had been treated with germicide gas. In the USA, microbiologists at NASA studied the techniques that allowed future scientific instruments to avoid a confrontation with terrestrial contaminants; they also knew that the grenades and bombs used in biological warfare contained microbes that could survive the force of impact on explosion and within favourable ecological conditions one single surviving spore could multiply itself infinitely. Might the Soviets have wilfully contaminated the environment on the moon? The Planetary Protection would and must bend itself to the priority interests of the cold war.

One month before the moon landing of Apollo 11 in July 1969, Time magazine headlined an interview with Carl Sagan " Is the Earth Safe from Lunar Contamination? " (2). This article explained that the scientific community

The capsule "Stardust" of cometary dust capture in a temporary clean room after recovery in January 2006.

as being " Alarmist ". However, the 20 November 1969, the astronauts Pete Conrad and Alan L. Bean retrieved the camera from the probe Surveyor 3, sent two and an half years earlier. When the NASA scientists examined it back on earth, they were surprised to find again some specimens of Streptococcus mitis still alive. These bacteria had succeeded in surviving 31 months in the emptiness of the moon's atmosphere.

Today, it is largely proved that the emptiness of space is not fatal for these forms of life, they can actually survive millions of years in the heart of an inorganic habitat; some specimens of cyanobacteria are, for example, perfectly resistant to high levels of ultra violet radiation exposure. These micro organisms can also survive in the form of spores in extremely high temperatures and without the presence of water.

Terraformation and panspermia

Since that era, scientific research in planetary protection has intensified and today one takes into account a scenario of maximum risk, alert and intervention, in the case of an environment that becomes totally toxic for the human being. NASA can not deny that it is essential to identify the bacterial environment of astronauts. They live in a confined environment, breath recycled air and drink recycled water, conditions which favour an increase in bacteria growth. The question of maximum control of astronaut's environment makes particular sense when one speaks of the biological terraformation (by the recreation of an atmospheric environment) of a planet like Mars and the theory of Panspermia (theory that asserts the possibility that Earth could have been inseminated by spores carried by cosmic dust).

A certain number of Hollywood science fiction movies have broached this subject: " Red Planet " which critiques the terraformation as " directed " panspermia (the terraformation creates mutant predators for mankind), or " Mission to Mars " which defends the idea that the Earth had been inseminated at its beginning, which therefore legitimises the return insemination of Mars. The theory of the panspermia was first put forward in 1908 by the Swedish chemist and Nobel Prize winner Svante Arrhenius, but one can find it again in the fifth century BC by Anaxagoras. This thesis is considered valid by a large number of scientists ever since NASA discovered a meteorite, fallen in Australia (Murchison) on the 28 September 1969. The meteorite contained traces of amino acids of a chemical origin and extra terrestrial, proving evidence of a chemical evolution of a type that allows the emergence of life on Earth. The thesis of panspermia was supported by Francis Crick and L.Orgel, co-discoverers of the double helix structure of DNA. In December 2002, in a study published in the " International Journal of Astrobiology ", researchers of the Office of Astromaterial Research and Exploration Science at the Johnson Space Center, NASA, Houston, demonstrated that a meteorite fallen to earth in the region of Lac Tagish in the Yukon, North-west Canada the 18th January 2000 contained a unpublished primitive organic matter, which was formed a long time before our solar system existed (3). The meteorite was collected - frozen - in unprecedented conditions of conservation and in isolation from any terrestrial contamination sources. Using electronic microscopes, the researchers were able to identify traces of hydrocarbon globules. These traces revealed themselves to be very similar to simulations produced in laboratories that attempt to recreate the initial conditions for the apparition of life forms in the universe, and moreover to hydrocarbon globules recreated from matter present at the beginning of the solar system and of interstellar space. The

Continuation of the article "Planetary Protection"

research in panspermia reveals itself to be very helpful for the research in terraformation and the eventual transmission of conditions for life on Earth to Mars and beyond.

Noah's Ark of Space

Other voices in the debate on Planetary Protection point out the risk of missing the possibility of discovering a biological message coming from out of space. The theory of possibility of a message transmitted by the means of a DNA marker surfaced in 1978. Two Japanese scientists, H.Yokoo and T.Oshima, proposed the hypotheses that a civilisation more advanced than out own could have prepared, in their laboratories, a biological agent to transport an encoded information (4). The two Japanese showed, in the periodical "Icarus", a study of a candidate virus, the PhiX174, which reproduces itself without the direct help of other living species. They constructed,

thanks to a complex method of decryption, drawings made from sequences of nucleotides of the virus PhiX174 that is normally not known to have a regular pattern. The pursuit is to look for arrangements of genetic patterns in living material that isn't random and indicates a digital code transporting information originating from an intelligent life from elsewhere in the universe. Nothing more concrete has come from this research, however it has inspired many people who want to encode biological messages and to send them to outer space among many other scenarios of cosmic Noah's Arks.

In this domain one can cite the strange ARC, Alliance to Rescue Civilisation, project led by William E Burrows and Robert Shapiro, who hoped to "protect the human race and civilisation against destruction that results from a global catastrophic event such as a nuclear war, terrorism, epidemic or a meteorite collision" by proposed a type of "back up disk for the planet" to be sent outside Earth, to the moon or elsewhere (5). This alliance to "save civilisation" speculated largely on the apocalyptic vision that wants the species to leave earth or perish. In 2001, this vision reaches a pinnacle point when the physician Stephen Hawking declared in the Daily Telegraph in London the 16 October - during the mass panic of bio-terrorism triggered by the Anthrax scare after September 11th - that a biotechnological virus could reduce our species to oblivion in the millennium. He said "The danger is that either by accident or design, we create a virus that destroys us" he continued "I don't think the human race will survive the next thousand years, unless we spread into space"(6). Behind this polemic, psychologists, terrorist experts, and space colonisation enthusiasts recognise that the fear of biological terrorism on earth contributed favourably to the idea of installing ourselves on other planets, at the same time as lamenting the reason for being negative (7). Other experts accused Hawking of scientific ignorance, asserting that his discourse is coloured by religious ideas. Eric Crody, a chemical and biological weapons expert from Monterey Institute of International Studies, affirmed rather cynically, that the fear stirred up by a virus that could annihilate the human species was nonsense and that the largest known epidemic to affect human kind decimated 20 to 40 million people and then stopped. According to Crody, a better argument for an exodus is the possibility of an asteroid crashing into the planet. Although, in the business of planetary missions, it is not fear that constitutes a " good " reason to act for the space agencies; be it fear of asteroids, nuclear war, planetary epidemics, pollution or industrial catastrophe. It is, beyond anything else, the limited resources of our own planet that constitutes the " positive " motivation for the free enterprise of space colonisation and the expansion of the civilisation.

NOTES

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The SAR, measurement established by the industry

by Maxence Layet

The notion of "specific absorption rate" dates from 1976, after the biological effects observed on laboratory animals. In the early 1980s, the C95 sub-committee of the American National Standards Institute (ANSI) decided on a limit of 0.4 Watt/kg for an exposure involving the whole body. A limit ten times weaker than the SAR of 4 Watt/kg, the minimum level at which biological effects (redness, heating, etc.) have been observed. At the same time, since the absorption of electromagnetic energy is shared out uniformly over the surface of the body, the experts have estimated that smaller parts could tolerate much higher doses, as much as 20 times stronger. This reasoning has allowed the local limit levels to be defined as 8 Watt/kg for 1g of matter. In the case of exposure concerning the general public, these maximum levels have again been divided by five. The revision thus made by the ANSI and the IEEE (Institute of Electrical and Electronics Engineers) arrived at SAR figures of 0.08 Watt/kg on average over the entire body. Or 2 Watt/kg in the case of a volume of 10g, and 1.6 Watt/kg for a volume of 1g.

Adopted in 1998 by the ICNIRP (International Commission on Non-Ionizing Radiation Protection), these levels have become the officially applied limits. Adopted by the OMS, these levels were then approved by the European Union Council on July 12, 1999, when the recommendation aiming to limit the exposure of the public to electromagnetic fields was adopted. The values used were identical to those formulated by the ICNIRP.

Approved in 2001 by the European Committee for Electrotechnical Standardisation (CENELEC), then adopted in national law, these community regulations in fact

Mobile Phones: "For whom the SAR tolls..."

BY MAXENCE LAYET,
SCIENTIFIC JOURNALIST

"Hello, is that the SAR?" The Specific Absorption Rate gives the "maximum quantity of power absorbed by body tissue". It corresponds to the dose of electromagnetic energy absorbed by any organism, human or animal, that is subjected to the radiation of an active radio-electric terminal. During a call, a mobile phone, like any other piece of radio-electrical equipment, "radiates" a certain amount of energy in order to emit its signal towards the nearest mast. Part of these electromagnetic radiations are absorbed by our heads or the nearest part of our bodies.

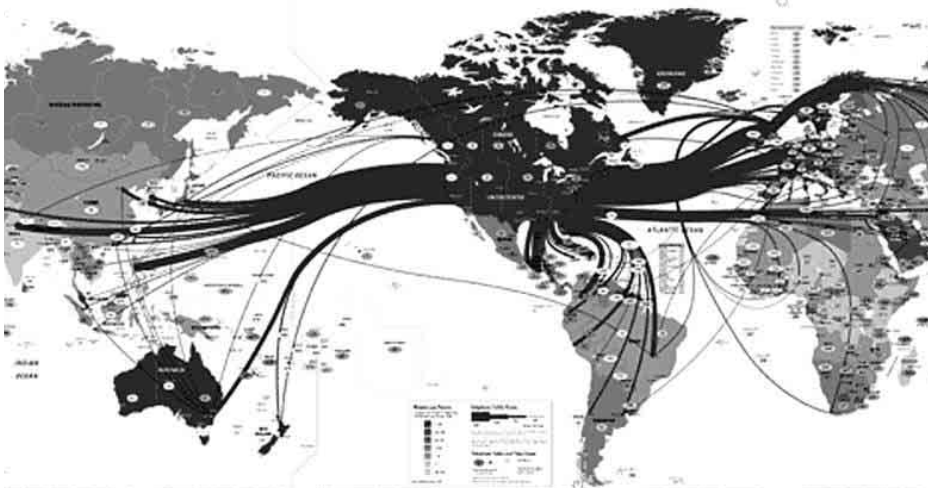
An internationally recognised unit of measurement, the SAR is expressed in watts per kilogramme (Watt/kg) and is determined for each exposure occurring at less than 20cm from the radiation source. European regulations fix a maximum local level at 2 Watt/kg for the head and the upper body (compared with 1.6 Watt/kg in Canada and in the United States); 4 Watt/kg for the hand, arms and legs; and a general SAR of 0.08 Watt/kg on average for the entire body.

Calculated for a phone used next to the ear, and provided in general by the manufacturers themselves, this level of exposure is essentially given only for mobile phones. But the SAR also concerns Bluetooth kits wrapped around the ear, cordless DECT telephones used in the home… without forgetting the babyphones used in bedrooms. The levels can be weak. No matter. The SAR is applied to every radio-electric terminal used at less than 20cm from the skin or the body. We speak of "near-field exposure".

In a living organism, the electromagnetic energy absorbed is not in fact harmless. It is the cause, among other things, of the heating of exposed skin, tissues and organs … we speak in this case about the thermal effect.

What is the SAR threshold below which the thermal effect is not without danger? It has been known since 1976. According to industrial and technical committees, this thermal effect becomes harmful if a rise of 1°C is observed in skin temperature. This arbitrary biological threshold fixed the upper levels of SAR, on the basis of which all SAR limits have been calculated. It corresponds to an SAR of 4 Watt/kg. After arbitrarily dividing it by 10, technical committees estimated that a level of 0.4 Watt/kg represented an SAR without risk for human beings. In 1991 in the United States, and in 1998 in Europe, the level was again divided by 5, defining a maximum limit of 0.08 Watt/kg for the non-informed public. In parallel, since physiological mechanisms of thermal regulation allow excesses of temporary heat to be dispersed, it was also agreed that a local rise in the temperature of 0.1°C (a tenth of a degree) was equally without risk and could very easily be borne locally by the organism. The limit of 2 Watt/kg corresponds to one of these local SARs, calculated for the skull and torso using a mass of tiny reference points - a cube of 1g or 10g for instance – instead of the whole body. This reasoning allowed for local SAR limits that were far above those for the whole body.

Since the SAR measures the effect of heat, that is, the radiation absorbed, several levels of SAR can be measured for the same energy emitted. The result of the SAR varies in fact according to extremely diverse parameters: the intensity of the signal, the sensitivity of the telephone and the kind of antenna used, the distance between the phone and the user's skull, the degree at which the handset is tilted towards the ear, the thickness of the ear itself (depending to its thickness, the ear acts as a "buffer", absorbing a variable part of the radiation). And of course according to whether the user is a child or an adult.



Global Communications Traffic map, 2005

In 1996, the work of Professor Om P. Gandhi of the University of Utah showed that children's brains could absorb up to 50% more radiation than an adult's. For equivalent radiation levels, the local SAR of a child's skull proves to be larger than an adult's. According to his calculations, "if the energy absorbed by an adult brain is 2.93 Watt/kg, the power absorbed by a ten-year-old child's is 3.21 Watt/kg and 4.49 Watt/kg for a five-year-old child's".

Since it only measures thermal effects, the SAR does not take into account other biological phenomena, called non-thermal effects. These effects are known and confirmed (including for human beings) for power levels typical of a "normal" use of a mobile phone. They include the modification of the path of cerebral waves (still observable two hours after exposure); the modification of hormonal secretions (notably those of adrenalin and melatonin); the increased risk of cancerous tumours (acoustic neurinoma); and the genotoxic effect, which is due to statistically significant damage to the DNA strands at the heart of our cells (the term used is the level of chromosomal aberrations).

The Reflex study, financed by the European Union and carried out between 2000 and 2004 in 12 laboratories in 7 different countries, confirmed that electromagnetic fields generated by mobile phones cause the rupture of ADN at SAR levels of between 0.3 and 1 Watt/kg, for example – inferior to the 2 Watt/kg limit recommended by the ICNIRP and taken up by the European Council.

In 2003, in the framework of the COMOBIO programme (Mobile Communications and Biology), the neurophysiologist Pierre Aubineau, then research director at the CNRS (Centre National de la Recherche Scientifique), observed the effect of the GSM mobile phone on the blood-brain barrier, confirming results already established in 1994. This barrier, formed by the meninges, plays a double role in protecting and regulating liquids flowing around the brain. His study, carried out on rats, showed that an exposure to the head, at SAR levels between 0.5 Watt/kg and 2Watt/kg for more than 10 minutes, brought about an opening of the membrane separating the blood vessels from the nerve cells of the brain, and the permeabilisation of the dura mater - the outer meninx, which has the most resistance.

Medically, the permeabilisation of the blood brain barrier is considered as a pathological phenomenon, causing the passage of undesirable substances, the formation of oedemas in the brain and an inflammatory reaction of the meninges. This neurotoxic action can bring about migraines or explain the appearance of tumours or degenerative diseases.

The newest addition to the range of family equipment, child surveillance systems called babyphones, are generally composed of 2 portable handsets, one for emission and another for reception. Technologically, this flourishing sector presents wide disparities, using frequency ranges situated around 40 MHz, 863 MHz, 900, 1900 and 2400 MHz, for instance… Is everyone aware that the manufacturers themselves officially recommend not to place the handset less than 1m or 1.5m from a baby?

The norms describing the calculation procedures in fact exist. But in what conditions do manufacturers like Motorola, LG, Nokia, Samsung or Sagem actually determine the SAR of their equipment? What certainty do we have that these levels are any more "trustworthy" or objective, since the only people enjoined to calculate and provide them are the manufacturers themselves? And how do they calculate the only SAR level given for bi-band, tri-band and quad-band mobile phones? Is a global or average SAR of the different SARs obtained after exposure to 900MHz (GSM) or to 1800MHz (DCS, DECT...)?

No figure exists today regarding the SAR of 3G telephones. In spite of the law, of the studies and the norms announced in Europe. The first 3G telephones, using the UMTS network, have however been on sale since Autumn 2005.

It is all as if a gigantic experiment were being carried out on a world scale, with the consumers as its unconscious guinea-pigs. New telephones are arriving, combining wireless GSM networks, Wifi, Wimax…

Where are their SARs?

Representing the system

BY BUREAU D'ÉTUDES

The invention of latitudes and longitudes, establishing a regular grid of measurement upon the ups and downs of the earth's landscape was an crucial tool in the mastery of territories and above all of the ocean routes, which were so important in the construction of globalised capitalism in the seventeenth century. Meshing this rationalisation of space with the rationalisation of time (sequenced in the twelve hours of the clock), produced a vast three-dimensional graphic system, a map of time zones that made it possible to synchronise activities the planet over.

This graphic device was merely one component amongst a whole set of tools that developed with the emergence of the rational state. The long-distance organs of perception of social complexity enabled the state to "see" the past and the present and, consequently, to foresee and programme the future. Toward the end of the eighteenth century, for instance, Fairplay introduced the bar graph and the sector diagram. The nineteenth century saw the appearance of Quételet's death curves in 1828, Walker's age pyramids in 1874, followed by the cartogram in 1882. Graphic statistics made it possible to encompass in a glance the society as a whole, to compare and contrast all the objects comprising it, and hence to make calculated forecasts. They contributed, in fact, to the decline of the hegemonic regime of discourse and its replacement by a dictatorship of measured facts – which would be the very foundation of social planning, social security and national accountancy. In so doing, they consolidated society in the same way as political constitutions and standardised school textbooks would do.

Whereas the administrative delineation of territory was achieved through the use of geographical maps and the administrative delineation of society through diagrams, the self-representation of the administration came about through the use of flow charts and organigrams. This particular form of representation stems from the organisation of the military. Streamlining the organisation of the Napoleonic armies, German General von Moltke organised the army into standardised divisions on the basis of their size, training and structure, equipping them all with interchangeable managers who had received uniform training in military academies. This divisionary system was copied by all the industrialised nations and improved

Advertising for the Rand corporation

The world's biggest hole is located in Russia.The gaint hole is actually a diamond mine in Eastern Siberia near the town Mirna. It is 525 meters deep and 1.25 km in the diameter.

still further through the integration of new telephone and telegraph technologies. The administrative system of the Ford factory largely drew its inspiration from the Prussian army with its logistical plans, its rules and procedures, its merit principle, and the breaking down of problems into their simplest components. The military bureaucracy used by Ludendorff to mobilise German resources during World War One (the Kriegswirtschaftsplan, or war-economy plan) was virtually identical to Ford's administrative system. The Gosplan, devised to implement long-range strategic planning objectives in the Soviet Union, was itself an adaptation of the German war-economy plan.

The growth of social rationalisation and the emergence of the technoscientific state led to new modes of modelisation, whose development was greatly invigorated by the twentieth century's two world wars. Centralised planning of the means of production carried out by the Soviet state, as well as by the British and American states in the course of World War Two, made it possible to prevail militarily over the centralised planning of the German and Japanese states. In Great Britain, the National Accountancy Table was developed in order to indicate in quantitative terms the conditions of British policies of resistance and victory over Germany. In parallel, the Input-Output Inter-Industrial Trade Table, showing the interdependencies between the different sectors of production, linking input (production factors) with output (products), was established in 1941 in the United States by Leontieff. General theories of balance and the social system thus became key planning instruments.

After World War Two, large-scale central planning was once again invigorated – this time by the advent of computers, which considerably augmented modelising capacities. Data processing programmes made it possible to integrate first dozens and subsequently hundreds of branches of input-output tables. These tables were brought into generalised use in national accountancy systems by means of international organisations (UN, OCDE) in the early 1960s. In all those regions under American control, they thus became a tool of normalisation and standardisation of economic policies.

Hayek critiqued these state planning policies, arguing that they led to a situation "scarcely different than that of slavery". Drawing upon the research of brain specialist Constantin von Monachow's descriptions of the workings of the human mind as the emergence of a spontaneous order based on the interaction of billions of neurones – experience selecting those interactions which are most useful for adapting to a given environment – Hayek called for a spontaneous, self-organised socio-economic order, emerging "from the relationship and mutual adjustments between its constituent elements." Imitating the brain's spontaneous ordering properties, this ideal market, because of its very complexity, could not be modelised and no representation or map, however sophisticated, could ever be made of it. This impossibility, Hayek thought, condemned in advance any interference by state planners.

The crisis of government and the inability of states to re-establish broad economic stability in the 1970s provided the impetus for a shift in the modelisation of the state: the centralised state, with its top-down power structure, yielded to a regulatory state, largely determined by Hayek's approach. The general schema of government is no longer linked, as it was in the post-war years, to the edification of a world state, conceived as a divisionary meta-administration. It now tolerates and profits from crises, conflicts and disorder in order to gain momentum for its own transformation and permanent adaptation to whatever changes are occurring on the planet. The techniques of governance thus simply seek to transform the maximum amount of noise into information, progressively integrating as its environment.

The application of cybernetics to politics and economics, the use of computer networks and telecommunications will deeply transform the organisation of the global system. The development of information and communications systems from the sub-surface level right up into outer space has opened new capacities of modelisation by providing the planetary real with an info-communicational *doppelganger*. This data-based double makes it possible to subordinate territory to its representation (thereby reinforcing management and long-distance control capacities). Every point of the territory, every object of the subject that inhabits it, is thus subjected to a data-based twin. It is in this context that the dream of total management tends to become a reality: the map being the territory, action on the map is at the same time action on the territory.

Summary

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